REPORT

FROM THE

SELECT COMMITTEE

ON

FOOD PRODUCTS ADULTERATION;

TOGETHER WITH THE

PROCEEDINGS OF THE COMMITTEE,

MINUTES OF EVIDENCE,

APPENDIX AND INDEX.

Ordered, by The House of Commons, *to be Printed,*
1 *August* 1894.

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253.

Food Products Adulteration.

Ordered,—[*Tuesday*, 29*th May* 1894]:—That a Select Committee be appointed to inquire into the working of "The Margarine Act, 1887," and "The Sale of Food and Drugs Act, 1875," and any Acts amending the same, and report whether any, and, if so, what amendments of the Law relating to Adulteration are in their opinion desirable.

Ordered,—[*Thursday*, 7*th June* 1894]:—That the Committee upon Food Products Adulteration do consist of Seventeen Members.

Committee nominated of—

Colonel Bagot.
Mr. Bolitho.
Sir Charles Cameron.
Mr. Channing.
Mr. Colman.
Mr. Colston.
Mr. Frederick Frye.
Mr. Herbert Gardner.
Mr. Maurice Healy.
Mr. Jeffreys.
Mr. Kearley.
Mr. Lambert.
Mr. Horace Plunkett.
Sir Henry Roscoe.
Sir Mark Stewart.
Colonel Warde.
Mr. Yerburgh.

That the Committee have power to send for Persons, Papers, and Records.

That Five be the Quorum of the Committee.

Ordered,—[*Friday*, 22*nd June* 1894]:—That Sir Henry Roscoe be discharged from further attendance, and that Mr. Pinkerton be added to the Committee.

Ordered,—[*Thursday*, 28*th June* 1894]:—That Mr. Maurice Healy, Mr. Horace Plunkett, Sir Henry Roscoe, and Mr. Pinkerton, be discharged from further attendance, and that Mr. Kilbride, Mr. Kennedy, and Mr. Dunbar Barton, be added to the Committee.

Ordered,—[*Tuesday*, 3*rd July* 1894]:—That Mr. Maclure be discharged from further attendance, and that Mr. Whiteley be added to the Committee.

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REPORT.

THE SELECT COMMITTEE appointed to inquire into the working of "The Margarine Act, 1887," and "The Sale of Food and Drugs Act, 1875," and any Acts amending the same, and report whether any, and if so, what amendments of the Law relating to Adulteration are in their opinion desirable;——HAVE agreed to the following REPORT:—

YOUR Committee find that at this late period of the Session it is not in their power to conclude their inquiry. They have, therefore, agreed to report the Evidence already taken to the House, and to recommend that a Committee on the same subject be appointed in the next Session of Parliament.

1 *August* 1894.

PROCEEDINGS OF THE COMMITTEE.

Monday, 25*th June* 1894.

MEMBERS PRESENT:

Mr. Colman.	Mr. Bolitho.
Mr. Jeffreys.	Mr. Frederick Frye.
Mr. Channing.	Mr. Kearley.
Sir Charles Cameron.	Colonel Warde.
Colonel Bagot.	Mr. Yerburgh.

Resolved, That Sir WALTER FOSTER be the Chairman of the Committee, and that in his absence Mr. CHANNING do take the Chair.

The Committee deliberated.

[Adjourned till Tuesday, 3rd July, at Twelve o'clock.

Tuesday, 3*rd July* 1894.

MEMBERS PRESENT:

Sir WALTER FOSTER in the Chair.

Mr. Herbert Gardner.	Mr. Channing.
Sir Charles Cameron.	Mr. Kilbride.
Mr. Jeffreys.	Mr. Kennedy.
Mr. Kearley.	Mr. Colston.
Mr. Yerburgh.	Mr. Colman.
Colonel Bagot.	Mr. Frederick Frye.
Colonel Warde.	Sir Mark Stewart.
Mr. Lambert.	

Room cleared. The Committee deliberated.

Parties called in.

Mr. *H. Preston Thomas* was examined.

[Adjourned till Friday next, at Twelve o'clock.

Friday, 6*th July* 1894.

MEMBERS PRESENT:

Mr. Herbert Gardner.	Mr. Colman.
Mr. Kilbride.	Mr. Dunbar Barton.
Mr. Jeffreys.	Mr. Frederick Frye.
Sir Mark Stewart.	Sir Charles Cameron.
Mr. Yerburgh.	Mr. Whiteley.
Colonel Bagot.	Mr. Kearley.
Colonel Warde.	Mr. Channing.
Mr. Colston.	

In the absence of Sir WALTER FOSTER, Mr. HERBERT GARDNER was called to the Chair.

Mr. *H. Preston Thomas* was further examined.

[Adjourned till Wednesday next, at Twelve o'clock.

Wednesday, 11*th July* 1894.

MEMBERS PRESENT:

Sir WALTER FOSTER in the Chair.

Colonel Bagot.	Mr. Kennedy.
Mr. Dunbar Barton.	Mr. Kilbride.
Mr. Bolitho.	Mr. Herbert Gardner.
Sir Charles Cameron.	Mr. Lambert.
Mr. Channing.	Colonel Warde.
Mr. Colman.	Mr. Yerburgh.
Mr. Colston.	Mr. Frederick Frye.
Mr. Kearley.	Mr. Whiteley.

Mr. *Richard Bannister* was examined.

[Adjourned till Friday next, at Twelve o'clock.

Friday, 13*th July* 1894.

MEMBERS PRESENT:

Sir WALTER FOSTER in the Chair.

Mr. Frederick Frye.	Colonel Bagot.
Mr. Colman.	Colonel Warde.
Mr. Channing.	Mr. Kilbride.
Sir Charles Cameron.	Sir Mark Stewart.
Mr. Jeffreys.	Mr. Bolitho.
Mr. Lambert.	Mr. Kearley.
Mr. Yerburgh.	Mr. Kennedy.

Colonel *Curtis Hayward* and Mr. *G. Embrey* were examined.

[Adjourned till Wednesday next, at Twelve o'clock.

Wednesday, 18*th July* 1894.

MEMBERS PRESENT:

Sir WALTER FOSTER in the Chair.

Mr. Bolitho.	Mr. Kilbride.
Mr. Channing.	Mr. Herbert Gardner.
Mr. Colman.	Colonel Warde.
Mr. Jeffreys.	Sir Mark Stewart.
Mr. Whiteley.	Colonel Bagot.
Mr. Yerburgh.	Mr. Frederick Frye.
Mr. Kearley.	Mr. Lambert.
Mr. Dunbar Barton.	Mr. Kennedy.

Mr. *Richard Bannister* further examined.

[Adjourned till Friday next, at Twelve o'clock.

Friday, 20th July 1894.

MEMBERS PRESENT:

Sir WALTER FOSTER in the Chair.

Mr. Bolitho.
Mr. Channing.
Mr. Colman.
Mr. Frederick Frye.
Mr. Herbert Gardner.
Mr. Jeffreys.
Mr. Kearley.
Mr. Kennedy.
Mr. Lambert.
Sir Mark Stewart.
Colonel Warde.
Mr. Whiteley.
Mr. Yerburgh.

Professor *James Long* was examined.

[Adjourned till Wednesday next, at Twelve o'clock.

Wednesday, 25th July 1894.

MEMBERS PRESENT:

Sir WALTER FOSTER in the Chair.

Colonel Bagot.
Mr. Dunbar Barton.
Mr. Colman.
Mr. Channing.
Mr. Colston.
Mr. Frederick Frye.
Mr. Herbert Gardner.
Mr. Jeffreys.
Mr. Kilbride.
Sir Mark Stewart.
Mr. Whiteley.
Mr. Yerburgh.

Mr. *Christopher Middleton* was examined.

Mr. *Richard Bannister* was further examined.

[Adjourned till Friday next, at Twelve o'clock.

Friday, 27th July 1894.

MEMBERS PRESENT:

Sir WALTER FOSTER in the Chair.

Mr. Channing.
Mr. Coleman.
Mr. Kilbride.
Mr. Frederick Frye.
Mr. Herbert Gardner.
Mr. Jeffreys.
Colonel Bagot.
Colonel Warde.
Mr. Dunbar Barton.
Sir Mark Stewart.

Professor *James Long* was further examined.

[Adjourned till Wednesday next, at Twelve o'clock.

Wednesday, 1st August 1894.

MEMBERS PRESENT:

Sir WALTER FOSTER in the Chair.

Mr. Channing.	Mr. Jeffreys.
Mr. Frederick Frye.	Sir Mark Stewart.
Mr. Coleman.	Mr. Yerburgh.
Mr. Whiteley.	

Mr. *Samuel William Farmer* and Mr. *Thomas Carrington Smith* were severally examined.

DRAFT REPORT, proposed by the *Chairman*, brought up and read the first time, as follows:—

"Your Committee find that at this late period of the Session it is not in their power to conclude their inquiry. They have, therefore, agreed to report the evidence already taken to the House, and to recommend that a Committee on the same subject be appointed in the next Session of Parliament."

DRAFT REPORT, proposed by the *Chairman*, read a second time, and *agreed to*.

Ordered, To Report, together with the Minutes of Evidence, and an Appendix.

EXPENSES OF WITNESSES.

NAME OF WITNESS.	Profession or Condition.	From whence Summoned.	Number of Days Absent from Home, under Orders of Committee.	Allowance during Absence from Home.	Expenses of Journey to London and back.	TOTAL Expenses allowed to Witness.
				£. s. d.	£. s. d.	£. s. d.
Christopher Middleton -	Gentleman - - -	Marton, R.S.O., Yorkshire.	3	3 3 -	3 13 4	6 16 4
Samuel William Farmer -	Farmer - - - -	Little Bedwyn, Wilts	1	1 1 -	1 4 -	2 5 -
Thomas Carrington Smith -	——	Admaston, Rugeley -	2	2 2 -	2 1 -	4 5 -

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MINUTES OF EVIDENCE.

Tuesday, 3rd July 1894.

MEMBERS PRESENT:

Colonel Bagot.	Mr. Jeffreys.
Sir Charles Cameron.	Mr. Kearley.
Mr. Channing.	Mr. Kennedy.
Mr. Colman.	Mr. Kilbride.
Mr. Colston.	Mr. Lambert.
Mr. Frederick Frye.	Sir Mark Stewart.
Sir Walter Foster.	Colonel Warde.
Mr. Herbert Gardner.	Mr. Yerburgh.

SIR WALTER FOSTER, IN THE CHAIR.

Mr. HERBERT PRESTON-THOMAS, called in; and Examined.

Chairman.

1. I BELIEVE you are one of the general inspectors of the Local Government Board?—I am. I was until recently in charge of the Public Health Department of the Local Government Board, which has to deal, among other matters, with the administration of the Sale of Food and Drugs Acts.

2. What are the Acts on the subject of adulteration which came under your notice?—The principal Act is the Act of 1875; there was an amending Act in 1879; and then there was the Margarine Act of 1887.

3. Will you tell us briefly the direction of the action of those three Acts?—The Act of 1875 provides for the appointment of a public analyst for every county, for every quarter sessions borough or borough having a separate police establishment, for the City of London, and for each of the London Vestries and District Boards; but this provision was slightly altered by the Local Government Act of last Session, which, in addition to transferring the appointment of analyst from quarter sessions to County Councils, took away from boroughs with less than 10,000 population the right of having analysts of their own, and placed them for this purpose under the jurisdiction of the County Councils.

4. Have those districts availed themselves of the provisions of the Act?—Practically in all districts they have either appointed analysts of their own or they have made an

Chairman—continued.

agreement under Section 11 of the Act for the services of the analyst of some neighbouring district.

5. Can you give us the number of analysts appointed?—There are 61 analysts acting for Administrative Counties; there are 61 acting for county boroughs under Section 10 of the Act; there are three acting for county boroughs under Section 11 of the Act (that is by agreement); there are 68 appointed by non-county boroughs, with a population of over 10,000; and there are three acting for non-county boroughs by agreement, under Section 11 of the Act. Then there is an analyst acting for the City of London, who is appointed by the Commissioners of Sewers; and there are 40 analysts acting under the vestries and district boards for London parishes. That makes a total of 237 districts for which analysts have been appointed or are acting under agreement; and practically that covers the whole of the country.

6. These analysts are all men of good qualifications, are they not?—Yes. Before the Local Government Board give their approval to the appointment of an analyst the Board require a statement of his qualifications; they require that he should produce evidence of competent microscopical knowledge, chemical knowledge, and also, to a certain extent, medical knowledge; that is to say, as to the effect of adulteration on health.

7. In some cases the same analyst acts for

Chairman—continued.

several districts, does he not?—That is frequently the case.

8. Can you give us an example of a number of districts being served by one analyist?—I have not specially taken out that point, but there would be no difficulty in doing so. I may say generally that in many cases analysts act for five or six districts.

9. Where do they reside?—They reside very often at a distance from the districts for which they are appointed; but I think no difficulty results from that, because there is a special provision in the Act of 1875, under which samples may be sent through the post as registered parcels, so that practically, however far the analyst may reside from the district, it brings it within a day from the purchasing inspector.

10. In your opinion there is no inconvenience from this non-residence of the analyst within the district?—So far as the papers which have been sent to the Board show, there is no inconvenience.

11. The Sanitary Authorities are not only empowered to appoint these analysts but they are empowered to obtain samples; through whom do they obtain them?—Certain officers are named in the Act. The medical officer of health is empowered to obtain samples, and one or two other officers, but practically the officers who really obtain the samples are, as a rule, the Inspector of Nuisances, and the Inspectors of Weights and Measures. In some places the police take samples. That is generally the case in the counties rather than in the boroughs. In the boroughs the other officers generally take them.

12. Do private persons take them?—They may do so, but the provision enabling private persons to obtain samples on payment of half-a-guinea or any less sum that the authority may fix, has been utilised to a very small extent. I fancy that is because private persons do not like to go through the trouble and the formalities of getting samples, and unless they are very sure that they are being cheated (and, indeed, very often not even then), they do not like taking the case into court. Practically, with the exception of a very small number, all the samples analysed are taken by inspectors on behalf of local authorities.

13. The first part of the Act deals, does it not, with certain special adulterations?—It deals with adulterations injurious to health. That part of the Act has been very little used; in the first place because adulterations injurious to health have, I think, diminished very much since the old days of the "Lancet" inquiries, and in the second place because as regards that part of the Act the fines are higher, and guilty or wilful knowledge has to be proved. As regards the second part of the Act, guilty or wilful knowledge has not to be proved. Of course it is exceedingly hard to prove wilful knowledge.

14. You think that the provision requiring guilty knowledge to be proved in regard to adulteration dangerous to health is at all events one explanation of that part of the Act not being very largely enforced?—I think, certainly, that is one explanation. The second explanation I should give is that the adulterations must be such as to be dangerous to health. And as to that I should say, in the first place, the fact of its being dangerous to health is very difficult to prove, and in the second place, I think such adulterations have diminished. If we are to believe the old inquiries people were poisoned constantly. Whereas now, if they are cheated, they are not poisoned.

15. You have told us there was a second, an amending Act, passed in 1879; for what purpose was that Act passed?—It was passed in the first instance to settle some legal difficulties which had arisen (I think they arose rather in Scotland than here) owing to a decision of the High Court of Justiciary in Scotland as to the term "to the prejudice of the purchaser" in the principal Act. It was contended on those words that a man could not be prejudiced if he bought not for himself but on behalf of the public; and in the Scotch courts that contention was established, though in a case which arose in an English court a contrary view was taken. The amending Act was passed in the first instance to settle that doubt, by making it plain that an inspector might be "prejudiced" within the meaning of the Act. In the second place, the Act authorised samples of milk to be taken in transit at railway stations; thirdly, it fixed the standard of strength for spirits, and fourthly, it made certain provisions as to the time within which summonses must be served in the case of perishable articles, and so on.

16. Then the Margarine Act of 1887 proceeded further, did it not?—It proceeded further, and a little differently in some respects. It was not exactly an amendment of the Sale of Food and Drugs Act, though it embodied a good many provisions of the Sale of Food and Drugs Act in it. It provided that every package of butter imitation should be labelled "Margarine" in letters 1½ inches square. The vendor, however, was protected by a warranty or invoice; whereas in the Sale of Food and Drugs Act he is protected by a sufficient warranty (though there have been many questions as to what a warranty is), but he is not protected by an invoice, though as to that, too, legal questions have arisen. Then, again, inspectors might take samples of "any butter or substitute purporting to be butter" (in the words of the Act) for analysis, without going through the form of purchase provided by the Sale of Food and Drugs Act. As to that particular point, I do not think there has been a decision on the subject whether the "form of purchase" includes the essential of purchase, that is to say, paying for the sample. I do not think it has become settled yet by any legal decision whether in point of fact an inspector under that Act may go into a shop and take a sample of any butter or imitation butter, or anything that purports to be butter for analysis without paying for it; whereas, under the Sale of Food and Drugs Act he has unquestionably to pay for every sample that he obtains. That is a point that is perhaps worth noticing.

17. In the Margarine Act the maximum penalty was raised considerably, was it not?—The maximum penalty was raised from 20*l.* under the second part of the Sale of Food and Drugs

Chairman—continued.

Drugs Act to 50*l.*, and even to 100*l.* in the case of repeated convictions, under the Margarine Act.

18. There have been a great many decisions in the High Court on various points arising out of these Acts, have there not?—A very large number of decisions. I have a note of between 60 and 70 decisions of the High Court on various points arising out of these Acts.

19. Are those decisions accessible?—They are all reported decisions, I think. I have a note of a very large number of them here; they are reported in some or other of the Law Reports; some, but not all, are reported in the authorised reports, and some in the *Times* reports, some in the Justice of the Peace Reports, and so on. We have taken some trouble to take a note of all such decisions, and I believe there are roughly between 60 and 70 of them.

20. If you could prepare a synopsis or a list of them, giving a little abstract of the cases, and hand it in, we could have it printed?—Yes, I will do so. (*See Appendix.*)

21. Will you describe to us the administrative action of the Local Government Board in connection with these Acts?—The Board, as I have said already, scrutinise the appointments and qualifications of analysts pretty narrowly. As a matter of fact, speaking generally, the science of analysis has progressed extraordinarily in the 19 years that have passed since the Act of 1875, and that I think is largely due to the efforts of the public analysts. On the whole there have been very few absolute blunders on the part of public analysts.

22. The Board also have returns from each of the local authorities, have they not?—Each analyst has to make to the authority appointing him a quarterly report stating the results of his analyses, and a copy of each of those quarterly returns is sent annually to the Local Government Board.

23. The Board make an abstract of those returns in their annual report, do they not?—The Board do, and that report is presented to Parliament annually.

24. Can you give us some account of the figures relating to those analyses between 1877 and 1893?—From 1877 to 1883 the number of samples rose pretty steadily from 14,706 to 19,648. In 1884 the Board issued a circular to sanitary authorities urging them to exercise their power of submitting samples for analysis. I ought to have said earlier that not only the authority appointing the analysts, but all sanitary authorities, have the power to obtain samples and send them to the analyst. But before that circular of the Local Government Board of 1884, very few samples had been submitted, except by the authorities who had analysts of their own, and the sanitary authorities generally had not paid much attention to the matter. After that circular, in which we called attention to their powers and the importance of exercising them, sanitary authorities exercised their powers much more extensively, and there was a sudden rise in the very next year from 19,648 samples to 22,951, and the subsequent increase has been pretty constant. The number of samples

Chairman—continued.

analysed in 1893 was 37,233 as compared with 14,706 in 1877, the increase being 153 per cent., though in that period the population had only increased by about 19 per cent.

25. Did the Board vary its directions to the districts at all during that period?—The Board used to urge, in their various circulars and communications and in their annual reports which were communicated to the local authorities, that at least one sample should be taken for each 1,000 of the population.

26. That was the standard the Board sought to attain?—That was the minimum standard the Board thought would secure a proper administration of the Acts. But it was not until the year 1891 that the proportion of 1 per 1,000 of the population was reached. By last year, however, things had got better, or at least the Acts were more extensively used, and the proportion had risen to one sample for every 779 of the population.

27. Then it took from 1876 to 1891 to reach the minimum standard laid down by the Local Government Board?—That is so.

28. And since 1891 you have got beyond that standard?—We have got down to one sample for every 779 of the population.

29. Those figures of yours are based, are they not, on the general average of analyses all over the country?—That is so; in some districts the proportion of samples is larger, but in many others it is much smaller. In London the proportion in 1893 was one sample for every 530 persons; in the provinces the proportion was one for every 847; but still, in many districts the Acts were, and are, almost a dead letter.

Sir *Charles Cameron.*

30. When you say "the provinces," do you include Scotland?—No, only England and Wales.

Chairman.

31. Can you give us any illustrations of districts where the Act was practically a dead letter?—Within the jurisdiction of the County Councils of Hereford and Montgomery and the Town Councils of 16 boroughs, including Northampton, with a population of 61,012, Colchester with a population of 34,559, and Dover with a population of 33,300, not one sample was taken for analysis during last year, and in the jurisdiction of the County Councils of Derby, Devon, the Soke of Peterborough, Oxford, Shropshire, West Suffolk, Carmarthen, Merioneth, and Pembroke, and in 18 boroughs including Sunderland, South Shields, Walsall, Ipswich, Great Yarmouth, Tynemouth, and Oxford, the number of samples taken was so small as obviously to afford no security against adulteration. In all there were 45 districts with an aggregate population of nearly three millions, in which the Sale of Food and Drugs Acts were either altogether in abeyance or so inadequately administered that the number of samples taken was quite insignificant, amounting in those 45 districts to only 496, or one sample during the year for every 5,720 persons.

Chairman—continued.

32. Have you any explanation to give of the peculiar neglect of the Act in those districts?—No; in all districts it depends entirely upon the will of the local authorities. In cases where no samples are taken and where very few samples are taken, the Local Government Board address a communication calling the attention of the County Council or the Borough Council, or the other authority, as the case may be, to the fact that the Act is not properly enforced in their district; sometimes with some result but very often with no result.

33. The Local Government Board have no further powers, have they, in the matter?—None; they have no compulsory powers in the matter.

34. I think it shows a satisfactory result in one respect, that the proportion of adulterations detected is decreasing, as compared to the number of analyses made?—That is so, certainly.

35. Can you give us some figures showing that?—I ought to explain that I have taken the year 1877 to start with because that is the first year for which we have the completed figures. The Act was passed in 1875, but the analyses in 1876 came in on no fixed plan; it was the beginning of things, and so that year was not taken, and accordingly the year 1877 is the one with which we start. In taking the five years, 1877 to 1881, the percentage of samples reported as adulterated was 16·2. In the following five years, ending with 1886, the percentage was 13·9. In the following five years, ending with 1891, it was 11·7. It reached its minimum in 1888, the percentage being 10·8 that year. Since that there has been some increase, and last year the proportion was 12·9, mainly owing, I think, to the two items of milk and spirits. It has to be remembered, however, that of the samples thus broadly classed as adulterated there are many in which the adulteration is so small in amount that it would not be and was not thought expedient to take the cases into Court. The analyst reported them as adulterated, but probably with a statement to the effect that the amount of adulteration was not such as to warrant legal proceedings.

36. The figures you give, as I understand, do not represent legal proceedings but the reports of analysts?—They represent the reports of analysts. I have some figures which I propose to give presently as to the number of cases in which legal proceedings were taken.

37. Could you give us any year in which you can state the proportions?—Taking last year (1893), 4,793 samples were reported against; proceedings were taken in 3,174 instances; and in 2,687 of those fines were imposed.

38. Were the convictions all cases in which fines were imposed, or were there some cases in which a warning or admonition was given?—I have a separation of the cases, and I can give further details, if desired, but the figures I have named are all actual cases of fines.

39. As between your two sets of figures, the 3,174 instances in which proceedings were taken, and the 2,687 cases in which fines were imposed, there is a margin?—Yes.

40. Were the people in all those cases found guilty?—No; some of those cases were dismissed; in other cases the people were let off with a caution; in other cases they were let off with paying the costs.

41. Do you know how many of those cases of caution and paying costs there were in each class?—I am not sure that I have that particular information here, but I could give the information to the Committee.

42. If you could draw up a little table showing that, it would be an aid to us; because it would give the complete result of those cases?—Certainly. (*See Appendix*).

43. The fines come to a considerable amount, do they not?—Yes; the aggregate amount of those fines was 5,091*l.* 12*s.* 8*d.*, the average penalty being thus 1*l.* 17*s.* 11*d.* as against 1*l.* 16*s.* 2*d.* in 1892, and 1*l.* 11*s.* 3*d.* in 1891; therefore the average amount of the fine has somewhat increased in the last year or two.

44. I suppose there had been previously complaints as to the smallness of the fines?—Constant complaints; it is very often said, and representations of all kinds have been sent to the Local Government Board to the same effect, that it is worth the while of a great many dealers to pay the fines and go on adulterating, and they do.

45. Are the maximum fines of 20*l.* often inflicted?—Very rarely; until the year 1888, even in the case of repeated convictions, there were very few maximum fines imposed at all; in that year there was not one fine of 20*l.*; but in 1889 there were six cases of a 20*l.* fine; in 1890 there were 11 cases; in 1891 there were nine cases; in 1892 there were 10 cases; and in 1893 there were 27 cases.

46. In the Margarine Act, which gives power to impose much larger fines, have those larger fines ever been imposed?—Very rarely indeed. I do not quite like to state the negative with confidence, because the papers have been looked through necessarily rather hurriedly as to this particular point, as I only received notice a very few days ago; but I think only two cases have been recorded in which these larger fines have been imposed, one of those being 45*l.* and one 30*l.*

47. You have had, you say, many communications made to the Local Government Board with regard to the amount of the maximum fine?—Yes, there have been very frequent suggestions to the Board that they should promote legislation providing that there should be a minimum fine laid down; but, of course, that would be opposed to the whole tendency of modern legislation in such matters, and also I imagine it would not secure the object desired, because a great many cases in which now a small fine is imposed would then be dismissed altogether. I imagine that that proposal may be looked upon as out of the question; but I only mention the fact that in the complaints we have received that has been suggested among many other things.

48. You mean, I presume, that if a minimum fund of 1*l.* or 5*l.*, say, was laid down by statute, then a number of cases would escape fines altogether?—Yes; the magistrate, in the case of some very small dealer, some old woman who had sold a quarter of a pound of coffee, and probably

Chairman—continued.

probably knew very little about it, would hesitate to impose a fine upon her of 1*l.* and would dismiss the case, whereas now he would impose a fine of half-a-crown.

49. What are the articles that chiefly come under the Acts, so far as the knowledge of the Local Government Board extends?—I have taken them in the order of the number of samples which are analysed, and they come in this order: milk, butter, spirits, lard, coffee, pepper, vinegar, bread, mustard, tea, beer, flour, confectionery (including jam), cheese, sugar, arrowroot, and cocoa. Then drugs, which I place by themselves.

50. Now will you take those in order; can you tell us how many samples of milk were analysed in the year 1893?—Generally between one third and one half of the entire number of samples are of milk.

51. You mean samples that were analysed, not necessarily adulterated?—Not necessarily adulterated. The proportion of adulteration I can give in each case. In 1893, out of 37,233 samples of all kinds, 15,543 were of milk, and of these, 2,310, or 14·9 per cent., were reported against.

52. That is to say, 14·9 per cent. were reported against by the analyst as adulterated?—That is so.

53. In how many of those cases were legal proceedings taken?—In 1,542 out of the 2,310 cases legal proceedings were taken; 152 cases were dismissed, 55 were withdrawn, and in 43 costs only were paid.

54. What occurred in the remaining number. There are 1,292 cases left, in which were convictions, I presume?—There were 1,292 cases in which penalties, amounting in all to 2,914*l.* 19*s.* 2*d.* were imposed.

55. Could you classify those penalties?—In those 1,292 cases there were 132 fines of 5*l.* each; 20 between 5*l.* and 10*l.*, 33 of 10*l.*, four between 10*l.* and 20*l.*, and 20 of 20*l.*

Sir *Charles Cameron.*

56. You mentioned that there were 27 cases of maximum fines in 1893 altogether; 20 would appear to have been in milk cases?—That is so. What I have given are the high fines. On the other hand, 192 cases were of 2*s.* 6*d.* or less, and 243 were between 2*s.* 6*d.* and 5*s.*

Chairman.

57. Then the chief adulteration, and practically the only adulteration, in these cases of milk, was water, was it not?—Water. The other additions that used to be reported, chalk and various things, if they ever were added to milk, are certainly, so far as we know, not added now. Practically, I do not think there have been more than two or three cases in the last 15 years in which such matters have been reported as added.

Mr. *Kearley.*

58. I presume there would be cases of extraction of cream?—Very frequently; but I am only speaking now of something being added.

Chairman.

59. Has the proportion of milk samples reported against declined during recent years?—In the first five years, 1877 to 1881, the proportion of milk samples reported against was 21·1; in 1882-1886 it was 16·7; in the next five years it was 13·2; in 1892 it was 13·3; and last year it was 14·9.

60. So that it is going up a little, apparently?—Slightly, in the last year.

61. How would you account for the alteration in the number of cases of this kind?—I have no doubt the Act has had a considerable effect in preventing people from selling diluted or adulterated milk. On the other hand, I think, as regards the difference possibly between those first five years, 1877 to 1881, when it was 21·1, and the last five years ending with 1891, when it was 13·2, some part of that apparent gain may probably be accounted for by the fact that analysts in the early times took a higher standard of milk than they do now. Therefore it is conceivably not entirely a gain in the reduction of adulteration, but there may be a difference in public opinion or in the analyst's opinion as to what is adulteration.

62. Does not the quantity of water in milk depend very much upon weather conditions?—That I have heard said. It is curious in looking through these percentages to observe that the percentage of adulteration depends very much upon the weather; because in a hot summer, when there is very little grass and milk is scarce, up goes the percentage of adulteration as a matter of course. On the other hand, if you get a very wet summer it goes down. For instance, in the Jubilee year, 1887, as everybody knows, there was magnificent weather throughout the summer, and very little grass; last year it was just the same sort of thing;—there was very little grass indeed. In 1887 the percentage rose immediately, and last year again the percentage rose very suddenly, as we have seen, from 13·3 to 14·9. I have not a doubt myself that the rise was due to that cause. On the other hand, in 1888, which was a very wet year indeed, when there was an enormous hay crop and plenty of food for cattle, there was very little adulteration. If we look at the percentages of adulteration, we find in the particular year, 1888, it was at the very lowest it has ever attained in all these years, namely, 10·8.

63. The coincidence at all events is interesting?—The coincidence is interesting.

64. It would act in two ways; first the hot weather would produce a greater demand on the part of the public and a lessened supply on the part of the farmer?—That would be so.

65. The consequence would naturally be that the farmer would have to make it up in some way or other?—Yes, and of course more milk turns sour the hotter the weather is.

66. This question of milk adulteration under the Acts is a very difficult one, is it not?—I think it is the most difficult question that has arisen under the Acts. The difficulty arises from the fact that science, in its present condition, cannot distinguish (whether it will ever be able to do so I do not know) rich milk that has been watered from milk that has not been watered, but is the product of a very old or very badly-fed cow.

Chairman—continued.

67. So that it is possible a man might have old cows on his farm, and in a year when herbage was deficient they would be naturally more or less badly fed, and his milk, which might be a very genuine article, might present a standard so low as to lead him to be brought up and reported upon as supplying adulterated milk?—That would be so; indeed, in the instances of cows supplying the worst milk of which we have any record, that milk is much thinner and has much less solids in it than most of the milk which is adulterated.

68. And so far, I believe, analysts have not been able to agree on any standard of solids that milk should contain?—The difficulty as to a standard is this: Of course analysts often feel obliged, knowing there is that great variation in natural and absolutely genuine milk, to abstain from reporting as adulterated samples which they would certainly refuse to certify as pure.

69. Can you give us some figures which I believe have been prepared at the Inland Revenue with regard to the quantity of solids contained in milk?—In the examination of the genuine milk of each of 273 cows by the chemical officers of the Inland Revenue, the "total solids" varied from 10·3 to 15·8 per cent.; and if between those limits a high standard were fixed, the result would be to condemn much genuine milk. If, on the other hand, a low standard were fixed, there would be a general tendency to water good milk down to it. Of course, if you fixed the standard low enough to include all cases of genuine milk, you might as well give up the thing altogether, because, as I just said, it is rare in watering milk to water it down to so low a standard as the genuine milk of the worst sort of cow would produce.

70. That is to the 10·3 standard?—Yes; I may say we have had individual instances, not from Somerset House, but from particular analysts, of milk from a cow, which had been milked in the presence of the analyst, which was considerably below 10·3; I think in one case I remember it even went below 9 per cent.

Sir *Mark Stewart.*

71. What instrument is generally used in those experiments for testing the quality of the milk?—I should prefer you to ask one of the technical witnesses that question.

Sir *Charles Cameron.*

72. Could you supplement the figures you have given us from Somerset House as to the total solids, by telling us the fatty matters?—I am afraid I have not got the details of the analysis here.

Chairman.

73. The Acts, as the Board stated in their report last year, are not intended to prevent the sale of articles of poor quality but only of articles wilfully adulterated?—That is so; and they added that "it would not be in accordance with the design of the Act that a poor man should be subjected to penal proceedings because his cow does not produce as good milk as the better bred and better fed herd of his richer neighbours."

Chairman—continued.

74. In different districts the proportion of milk samples reported against differs very widely, does it not?—Very widely indeed; for instance last year the proportion of samples reported against in London generally (taking all the districts of London together) was 25 per cent.; it was 19 per cent. in Birmingham; it was 18 per cent. in Liverpool; but on the other hand it was only five per cent. in Manchester and three per cent. in Salford and in Cardiff.

75. It differs also in the various districts of London, does it not?—Yes, even in districts next to each other, and presumably, as one would think, to a large extent receiving their supplies from the same sources. For instance, in the year 1888, I find in the parish of St. Marylebone, out of 258 samples of milk only 15, or 6 per cent., were reported against; whereas in St. Pancras, out of 129 samples, no less than 55, or nearly 43 per cent., were condemned. In the same year in Woolwich the proportion was nearly 6 per cent.; in Greenwich it was 22 per cent. Again in the year 1891 the proportion of adulterated samples to the total number examined ranged from 46·8 in the parish of St. George-the-Martyr, Southwark, and 47·2 in Lambeth, to 1·6 in Lewisham, and none in Hampstead, and none in St. James', Westminster; that is to say, all the samples examined from those two parishes were pronounced to be genuine.

76. Do you think there is any difference in the way the samples are taken to account for that?—That I cannot say. The official papers of the Board do not show any explanation of that fact.

77. In some cases the samples are taken by inspectors in uniform, are they not?—That has been so in some cases, and that is obviously a way to get, not the average milk supplied, but, as I have known in one or two cases, milk with a little extra cream in it. In one particular case the analyst was astonished at the sample that he got. It had been taken by an inspector whose official character was recognised, and it had got about twice the amount of cream that the very best milk will give.

78. In one borough, Salford, there seems to be a very good administration in the way of milk inspection?—There must be something exceptional about Salford. In Manchester it is very good, and they have reduced the amount of adulteration wonderfully; but in Salford they have reduced it still more, and for a great many years Salford has figured as having, according to the official figures (whatever they are worth) one of the best milk supplies of the kingdom.

Sir *Charles Cameron.*

79. Are you aware that in Manchester and Salford they make use of the powers for the interception of milk on the way to the consignee, and in Liverpool, owing to some construction put upon the Act, they do not do so; has that been called to your knowledge?—I was aware that in Salford and Manchester they did that a great deal, and I think in all big towns where they really carry out the Acts with efficiency, use is made of that provision of the Act of 1879. I was not aware that they did not do so in Liverpool.

Sir *Charles Cameron*—continued.

80. I was going to ask whether if that was so in Liverpool that would give any explanation of the difference?—I was not aware that it was so in Liverpool; it has not been brought before the Board, so far as I know.

Chairman.

81. Have you anything to say with regard to condensed milk?—Condensed milk is often made from skim milk and contains very little nourishment. Infants, it is said, would be half starved if fed on this milk alone, and it seems to be a question whether, just as skimmed milk cannot be legally sold without adequate notice to the purchaser, so all condensed milk that has been made, not from the natural produce of the cow, but from milk from which the cream has been removed, and still more when it has been separated by use of a "separator" (which, as I understand, takes out the solids more completely than the ordinary skimming) should not be subjected to the same rule. The Board received a very influentially signed representation from very eminent members of the medical profession in London, from a large number of analysts, and from other persons whose opinion would carry great weight in such matters, as this, as to the harm that is being done by the use of these inferior brands of condensed milk, some of which are made in Ireland, and some of which are made in Switzerland. The best brands of Swiss condensed milk are extraordinarily rich and leave nothing to be desired; but the contrast between them and this condensed milk made from separated milk is very great indeed. That is becoming a very serious evil, because people do not understand the difference between this brand and that brand; an uninstructed person cannot tell, and I suppose nobody but an analyst can tell, from the mere taste of the condensed milk, whether it contains a sufficient amount of cream in it or not.

82. Though some of the brands are good, there are upon the market a number of brands of condensed milk which are not good?—A number are not good.

83. Has your attention been called to separated milk at all, and the large amount of that which is put upon the market now?—Yes; the Board have received a good many statements as to that fact. As I understand, separated milk is skimmed milk; but it is something more than skimmed milk, because the separator skims it much more completely, and takes the solids much more completely out than ordinary skimming.

84. Would you not rather say it is something less than skimmed milk?—It leaves something less than skimmed milk.

85. Still it may be genuine?—Still it may be genuine. The sale of it, I imagine, would come under the same special provision as applies to skimmed milk in the Act of 1875.

86. But so far as it goes, it is a genuine article, is it not, and a useful article for the poor?—I imagine the nutritive value of separated milk is very small indeed. Of course the ordinary skimmed milk contains such a proportion of solids that it is very useful. It has a nutritive effect, as one knows, because pigs that are fed upon it thrive upon it.

Chairman—continued.

87. Have you anything more to say about milk?—I think that exhausts the subject of milk.

88. Then passing to butter, will you give us the particulars with regard to that?—About one-sixth of the total samples that formed the subject of analysis are butter.

89. The number of samples of butter has varied in the same way as the number of samples of milk?—Yes; but whereas the adulteration of milk seems from the figures to have declined, the adulteration of butter from the figures does not seem to have declined materially. In the first five years, beginning with 1877, the percentage of so-called butter samples reported against was 13·9; in the next five years it was 17·9, in the next five years it was 13·4, in 1892 it was 15·3, and in 1893 it was 13·7.

90. Is it now practically about the same as it was in 1877?—Practically the same; practically the sale of Food and Drugs Acts does not seem to have had much effect.

Sir *Charles Cameron.*

91. When you used the word "reported," do you mean reported under the sale of Food and Drugs Act or under the Margarine Act?—Both; the cases are not distinguished in the returns which come to us.

Chairman.

92. After the passing of the Margarine Act in 1887, was there any difference?—Yes, there was a sudden drop then in the year 1888 from 17·5 of the previous year, 1887, to 10·4, but the figures have risen since, and the subsequent percentages have been 13, 11½, 15½, 15, and 14.

93. Can you give us the results of the year 1893?—In the year 1893 there were 794 samples of so-called butter which were reported against; there were 604 prosecutions, 29 cases were dismissed; in six the proceedings were withdrawn; in 18 the vendors were required to pay costs; and in 551, penalties were inflicted amounting in all to 1,150*l.* 1*s.* 6*d.* There was one fine of 45*l.* (that must have been under the Margarine Act, of course); three of 20*l.*; three between 10*l.* and 20*l.*; nine of 10*l.*; eight between 5*l.* and 10*l.*; and 56 of 5*l.*; the others being smaller amounts.

94. The mixture of margarine with butter became more general, did it not?—That appears to have been the case of late years. I have no doubt that, on the one hand, scientific knowledge has been brought in to help the adulterator as well as to help the analysts who detect the adulteration; and then the art of introducing as much water as possible has been brought to a very high point.

95. So that the two adulterants of butter now are margarine on the one hand, and water on the other hand?—Yes. They stand on a little different level, because, whereas margarine, which is a compound of beef fat and so on, is entirely a foreign ingredient; on the other hand, water is a constituent of all butter. There is a legitimate amount of water in butter. Even some very good butters have a large amount of water in them; the butter-milk is not adequately

Chairman—continued.

squeezed out. The very firm butter that people like to see on their breakfast table is only made by taking care to squeeze out the butter-milk; but besides that omission to squeeze out the butter-milk, there is an intentional addition of water to the butter.

Mr. *Frederick Frye.*

96. Is there more impurity in that respect in butter than in margarine?—That I could not say. I have not heard the question of the addition of water to margarine raised at all. I have only heard the question of the addition of water to butter.

Chairman.

97. We have a kind of parallel position with regard to butter and to milk in the addition of water, have we not?—That is so.

98. We have no standard as regards milk which would enable us to prosecute in the case of some of the inferior qualities of milk, and we have no standard as to the amount of water that may be contained in butter to enable the law, as it at present exists, to seize upon those specimens as adulterated?—That is so.

99. Have you anything further to say about butter?—No; that is all I have to say about butter.

100. Then passing to spirits, have you anything to say to the Committee upon that subject?—Three thousand nine hundred and seventy-one samples of spirits were analysed in 1893, of which 782, or nearly 20 per cent., were reported against for excess of water. The practice of adding deleterious ingredients, capsicum, sulphuric acid, and so on, if it ever existed, seems, so far as the returns show upon which I have to go, to have ceased almost entirely; the adulteration detected consists only of dilution and not the addition of substances.

101. The fact is that with regard to spirits you have a certain standard?—We have a standard fixed by the Act of 1879.

102. That is a great help, is it not, in the analysis?—That no doubt very much indeed simplifies the work of the analyst. But the standard was fixed then to obviate the difficulty arising from the fact that there were no means previously of deciding what was spirits and what was spirits and water. Nobody, for instance, could drink gin as it comes from the still, for its strength is then about 50 per cent. above proof. All gin has therefore to be watered to make it consumable. But till that statutory standard was fixed, there was considerable difference of opinion amongst analysts as to what amount of dilution constituted adulteration. But as those figures I have given show, the establishment of a standard has not had the anticipated result of suppressing adulteration, or at all events of getting rid of the very large proportion of samples which are reported as adulterated. Although there is a standard for this article, it is among those as to which the proportion of adulteration, according to these returns, is the greatest.

103. So that the standard existing in the case of spirits is not effective?—It is not effective in preventing the sale of spirits watered below the standard.

Mr. *Frederick Frye.*

104. I suppose a man may sell spirits adulterated with any amount of water provided it is so stated on the bottle?—Yes, that is the state of the law; it is always a question of the adequacy of the notice. There was the case of Sandys *v.* Small, in which the High Court decided that if they put "all spirits sold in this establishment are diluted," as they do put in a great many drinking bars now, and if they bring that sufficiently to the notice of their customers, they are enabled to sell spirits below the standard prescribed by the Act.

105. That is 25 per cent. under proof?—It is 25 per cent. for brandy, whisky, and rum, and 35 per cent. for gin.

Chairman.

106. Have you anything more to say about spirits?—No.

107. Then what have you to say about coffee?—With regard to coffee, there has been some diminution in the percentage of the samples reported against, which was about 18 per cent. in the 10 years from 1877 to 1886, and has since been about 15 per cent. In many instances the proportion of chicory has been enormously large, frequently rising as high as 70 or even 80 per cent. For example, there is one case I have a note of here, where the vendor of a preparation advertised as "fine French coffee, a blend of finest East India and other coffees carefully prepared by the new French process, whereby the aroma and properties of the coffee are fully developed," was prosecuted and fined because it was found that the French developing process consisted solely in a mixture of 90 per cent. of chicory with 10 per cent of coffee.

Mr. *Frederick Frye.*

108. Was that the Pontypridd case?—No; that was earlier than the Pontypridd case. Some of such preparations are sold with labels, in which the word "coffee" is printed very prominently, while the word "chicory" is scarcely legible. The price is generally very low; but as chicory is only worth something like 3*d.* per lb., it is very profitable to sell it mixed with a quarter of its own bulk of coffee at the price of 10*d.* or 1*s.* a lb.

Chairman.

109. Then in some cases they are very ingenious, are they not, in making berries to resemble coffee berries?—In one case the coffee was ground before the eyes of the inspector, and I suppose they thought then he would possibly not send it to the analyst after all. But he did send it, and it was found that it was very largely adulterated with chicory. There used to be an old practice, which we thought had died out till we came across this case, of compressing chicory into the shape of coffee berries. I have no doubt that in this case they put in chicory which was perhaps coloured in some way and made to imitate coffee berries.

Mr. *Frederick Frye.*

110. That is an isolated case, is it not?—Yes. I only mention it as being a curious case, not as anything substantial.

Chairman.

111. Is there anything else you would like to say about coffee?—No.

112. The chief adulteration, I understand, is that of chicory?—Yes.

113. Then as to lard, that is adulterated occasionally with cotton seed oil, is it not?—Yes, and lately a practice has arisen of adding beef fat stearine, which, I believe, stiffens the inferior sorts of pork fat and enables the makers to use certain inferior kinds which they would not be able to use unless they added stearine.

114. Water is added to lard, is it not?—Yes, that has been occasionally a ground of condemnation.

Mr. *Frederick Frye.*

115. The stearine would not be injurious to health, would it?—I believe not.

Chairman.

116. Can you give us the number of samples of lard that have been analysed last year?—Sixteen hundred samples were examined last year, and about 8 per cent. were condemned.

117. What have you to say about pepper; is that much adulterated now?—That seems to be no longer adulterated to any considerable extent. In the last three years the proportion of samples reported against was only about two per cent.

Mr. *Frederick Frye.*

118. That has probably arisen, has it not, from the large number of prosecutions two or three years ago?—It became a common practice to grind up pepper husks with the pepper, and that form of adulteration was a good deal used, and since then it has dropped; there is very little now as far as the reports show.

Chairman.

119. You attribute the non-adulteration of pepper now to the fact that active steps were taken under the Acts against persons who did adulterate?—I think that may be so.

120. Then with regard to vinegar, vinegar has been adulterated lately, has it not?—Till the last few years there were very few instances of vinegar being taken for analysis, but last year the number of samples analysed suddenly rose to 1,015, as compared with only 186 in the previous year. Of those 1,015 nearly 16 per cent. were reported against, mostly on account of their having been produced from substances other than malt, and, as the Board remarked in their report of last year, some of the cases seem rather to raise a doubt as to whether the making of vinegar in any of the ways common in parts of the country from the vinegar plant, from sugar and water, and so on, must be held to be prohibited. It is a question whether vinegar must be always malt vinegar, or whether malt vinegar is always asked for by the inspector, and that I am unable to say, because in the papers that have come to the Board there is no special distinction made between malt vinegar and vinegar.

Mr. *Frederick Frye.*

121. Is it not the fact that quite recently there has been a raid on the vinegar merchants?—The figures mounted up from 186 to over 1,000 last year.

Mr. *Kearley.*

122. I presume that would be caused by the increased activity on the part of the inspectors?—Yes. I believe there were a good many publications in the papers about vinegar, and the inspectors were active.

Chairman.

123. Passing on to bread and flour, I believe you have very little to say as to adulteration there?—In the last two years, out of 1,000 samples analysed only five have been reported against. I believe sometimes a little alum is put to whiten seconds flour, but the practice is almost obsolete.

124. As regards mustard, the proportion of adulteration is not very high, is it, and not very serious in character?—Such adulteration as there has been almost invariably consists in the addition of a certain amount of wheat flour, and perhaps a little turmeric for colouring purposes. The Board in one of their reports remark, "Such a mixture has been sold for many years under the name of mustard; and the wheat flour is added, not for adulteration, but because pure mustard is apt to be unpleasantly bitter, and moreover is liable to ferment and decompose if heated." That was the report of the Board according to the information they had, and they added that: "Most people buying mustard for the table would prefer the usual preparation, and as the question is one rather of nomenclature than of fraud, there is some justification for the occasional refusal of magistrates to impose a penalty when proceedings are taken in such cases."

125. Then passing on to beer, we have heard a good deal about pure beer lately. Have you anything to say about your experience in that matter?—The remarkable thing about it is, that although we are constantly hearing about drugged beer and stupefying chemicals which have such a great effect in promoting drunkenness, and so on, yet, so far as the official returns (as to which alone I am speaking) show, the only adulterant that is reported is salt: speaking broadly, the adulterant is always an excess of salt and scarcely anything else. But then, of course, it must be observed, as was also said in one of the Board's reports, that as beer under the existing law may consist of any substitutes for malt brewed with any substitute for hops, it is difficult for an analyst to condemn a sample, except on the ground of its containing some ingredient like salt, which is clearly neither a substitute for the one nor the other.

126. You mentioned confectionery, under which you included jam; have you anything to say on that subject?—It is now almost invariably reported as pure; and I think that in that particular the Sale of Food and Drugs Acts have been very beneficial, because there is no doubt that until attention was directed to this matter a lot of poisonous pigments were intro-

Chairman—continued.

duced in confectionery, which did a good deal of harm to children and so on. Now, the makers take infinite care, and as a matter of fact we never hear now of any of those pigments being used.

Mr. *Frederick Frye.*

127. I presume the materials are now so cheap, that there is no need for adulteration?—I daresay that may account for it in part.

Chairman.

128. Now, as to tea, tea has been adulterated in the past, but has not been much adulterated recently, I believe?—That is so. Out of nearly 1,600 samples examined during the last four years, not one has been reported against.

Mr. *Frederick Frye.*

129. I believe there used to be a great many cases of adulteration, used there not, before tea was allowed to be examined in bond?—I was about to mention that.

130. Since then, there has been absolutely no case of adulteration at all?—I would not say absolutely no case, but there have been very few. I was about to say the improvement is no doubt partly due to the fact that tea is subjected to a special provision which enables the Commissioners of Customs to examine it in bond, and to refuse to allow its importation.

Mr. *Kearley.*

131. They have power to confiscate it, have they not?—Yes; and in a few cases in each year some packages are actually confiscated, and some are allowed to be sent back for exportation. The adulteration of tea used to be enormously prevalent a century or so ago when the prices were enormously high, and there is an old Act (17th George III., Chap. 29) which recites that "great quantities of sloe leaves, and leaves of ash, elder, and other trees and shrubs" are manufactured and sold in imitation of tea, and then the preamble of the Act goes on to say "such evil practices are increased to a very great degree to the injury and destruction of great quantities of timber, woods and underwoods, the prejudice of the health of His Majesty's subjects, the diminution of the revenue, the ruin of the fair trader, and to the encouragement of idleness." That picture of the destruction of the woods of England to make adulterated tea is in curious contrast to the fact that at the present day tea is not adulterated, and wherever you buy the tea it is absolutely pure.

Mr. *Colman.*

132. The change you have referred to was practically in accordance with the decision of the Committee of 1874, was it not?—Yes; it was incorporated in the Act of 1875.

133. Is the improvement simply and solely traceable to the principle of inspection at the port of entry?—I would not quite say solely.

134. Very largely traceable to that?—Yes. The abolition of the duty must have had an enormous amount to do with it, the price of tea being so very low now; just as in the case

Mr. *Colman*—continued.

of sugar, sugar undergoes no such examination at the port of entry, but sugar is not adulterated any longer; it is not worth adulterating.

Chairman.

135. With regard to drugs, can you tell us the proportion of drugs reported against; does it continue to be large?—It does continue to be large. It is now about 13 per cent.; but in their Report for 1892 the Local Government Board remarked that as only about one-third of the samples reported against were the subject of prosecutions, and in only one-sixth were fines imposed, it was possible that the substantial adulteration of drugs might be more rare than the percentage would seem to indicate. No doubt there have been cases such as that, for instance, of sweet spirits of nitre, which I think used to be a very common subject of prosecution. The special point in which that failed to satisfy the analyst was very often there not being the proper amount of spirit in it. That happened very often from no fault of anybody, but from carelessness; the spirit had evaporated. There have been cases of that kind which I think may partly account for the rather striking fact that in only one-sixth of the cases reported against in a particular year were fines imposed. Therefore the adulteration of drugs is probably not nearly so common as it may have been in times past.

136. I think you have from time to time received at the Local Government Board suggestions as to how the state of things you have been describing to us might be remedied?—That is so. I have here a note of some of the suggestions. Altogether the suggestions for alteration have been of an enormous number, but I have taken a few of them which seem to be of importance, and I am prepared to state what the suggestions are, without of course expressing any opinion (which I am not authorised to express) upon them.

137. Would you just give us, as far as you can, a brief statement of the suggestions that seem to you most worthy of attention?—One is that the wholesale vendor should be brought within reach of the Acts. Practically it is very difficult to get at the wholesale vendor. One of the suggestions was that there should be incorporated with the Acts some such provision as there is in the rules of the Supreme Court of Judicature, by which the retail vendor should be empowered to join with him by simple statutory notice the wholesale dealer as a co-defendant. Various London vestries have made that suggestion. It has been also suggested that Section 25 of the Act of 1875 should be amended by incorporating with it a provision like Section 47, Sub-section 3 of the Public Health (London) Act 1891. That provision in the Act of 1891 relates to the seizure of unsound meat; and the suggestion that has been made to the Local Government Board is that a similar section should be applied to all foods or drugs as to which prosecutions are instituted.

138. Will you read to us the Sub-section of the Act of 1891 to which you refer?—That Sub-section is as follows: "Where it is shown that any article liable to be seized under this section and found in the possession of any person was purchased

Chairman—continued.

purchased by him from another person for the food of man, and when so purchased was in such a condition as to be liable to be seized and condemned, under this section the person who so sold the same shall be liable to the fine and imprisonment above mentioned unless he proves that at the time he sold the said article he did not know and had no reason to believe that it was in such condition."

139. Have any suggestions been made to you with reference to invoices being regarded as warranties?—Various suggestions of that kind have been made, some that all invoices should be regarded as warranties, as they are under the Margarine Act. Then there is a suggestion from the other point of view, that no warranty should protect the vendor, and that the Margarine Act should be strengthened, especially Section 7. It is said in this respect that the invoices from the foreign shipper, who cannot be reached, may protect the vendor.

140. As regards fines, have you any suggestion to make as to fines?—Yes; there have been complaints from two or three sanitary authorities that they have instituted proceedings, and that the fines do not go to them, but that they go to the county fund.

141. And I suppose it is thought if the fines went direct to the prosecuting authority they would be stimulated to do a little more work?—Yes; they consider it rather hard that they should have the trouble and cost of taking the proceedings, and yet, when the fine comes, it goes to someone else who has had nothing to do with them, or at any rate has only had the charge of appointing the analyst.

Mr. *Kearley.*

142. Do I understand that the fines do not go to the local authorities now?—No, to the county fund.

Mr. *Colman.*

143. Is that so in London?—In London there is a special provision as to fines. In London they go to the Receiver of the Metropolitan Police District.

Chairman.

144. Of course you have a large number of suggestions as to the standard for milk, have you not?—A very large number. I have already stated the difficulties which have presented themselves.

145. Is there anything about the labelling of milk?—Yes; one suggestion is that vendors of milk should be compelled to label churns or other vessels containing skimmed milk or milk mixed with water, and that the names and addresses of responsible persons should be painted on all vehicles from which milk is sold, and they shall be liable for the sale.

146. That would give the poorer class of the public a better opportunity of obtaining redress, would it not?—Yes; I do not suppose the poor would prosecute really, it would be the inspectors really who would prosecute, but now they have a difficulty in finding the right man to go against.

147. Then that arises from the fact, does it not, that they give false names and addresses?—Yes, and there is a suggestion that they should be registered.

Chairman—continued.

Mr. *Frye.*

148. Is that with regard to the retail milk trade?—Yes, the man who hawks milk about in a cart.

Chairman.

149. Then, on the other hand, while you want to give the local authorities these extra advantages, there have been suggestions made, and very properly made, that the vendors should also be protected by having a claim to an analysis of a sample taken at the same time?—Yes; there is what has seemed to some of these complainants a hardship in this, that one of the most useful provisions of the Act of 1879 is enabling inspectors to take samples at railway stations; but it was decided by the High Court that the various formalities which are imposed on a purchaser under the principal Act, that is, of dividing a sample and reserving a sample for analysis, and so on, did not apply, and could not be made to apply to the taking of samples at railway stations; and there have been complaints that this may be rather unfair because, supposing the analyst makes a mistake, the vendor has no second sample to go to; there is no chance of his getting a separate analysis on his own behalf, and they urged that the Inspector should be compelled to divide the sample and to give notice to the seller where he may obtain a portion for independent analysis.

150. Some people have thought, have they not, that milk and cream, or condensed milk from which cream has been removed, should be separated and labelled? — Some urge that separated milk should be labelled, or the cans should be labelled, while others advocate that condensed milk produced from skimmed milk should also be separately labelled, and that the label should contain the words "separated" or "skimmed" in as bold characters as the rest of the label.

Mr. *Kearley.*

151. But that is the law now, is it not, that is done as regards skimmed condensed milk, is it not?—I think in some cases the complaints that are made to the Local Government Board are, that it is practically not done.

152. There are frequent prosecutions where it is not done, but it is the law under the Act, is it not? There are clauses in the Act at the present moment to compel that being done, are there not, as far as regards condensed milk?—There is Section 9 of the Act of 1875.

Chairman.

153. I think the suggestion has also been made that there should be a standard for the water in butter?—Yes.

154. Then there is another suggestion I have heard of, that margarine should be specially coloured green or red or some other colour, so as to prevent it being confused with butter, what do you say as to that?—Yes, and also that it should be sold in specially shaped blocks, that is another suggestion. Then there is a

Chairman—continued.

suggestion that coffee mixture should specify the exact proportion of coffee and chicory which is provided for in one of the Bills before the House this year.

155. Chicorine was suggested, I suppose, was it not?—Yes, on the analogy of margarine, that if butter mixed with certain matters be called "margarine," why should not coffee mixed with chicory be called "chicorine"?

156. Another suggestion has been made as to the use of salicylic acid and other acids for preservatives?—Yes, there has been that suggestion. I may say that the Board, on the subject of the general use of those preservatives, remarked in one of their reports that it was not always clear in what cases the addition might come within the proviso of Section 6 of the Act of 1875, with regard to "any matter or ingredient not injurious to health" which "has been added to the food or drug, because the same is required for the production or preparation thereof as an article of commerce in a state fit for carriage or consumption."

157. Are these suggestions made to the Local Government Board that the use of salicylic acid and other things are prejudicial to health. Have they given any opinion upon the suggestion?—They have stated they have no evidence, I think, as to actual injury to health having been caused by such mixtures. Of course, it is an infinitesimal amount of these preservatives that are used, and they remark that no doubt to prohibit them altogether, whether it was or was not necessary, would involve probably the waste of a good deal of good food which is now preserved by their means. They went no further than that.

158. Then the taking of samples *in transitu*, as in the case of milk, has been suggested with regard to other goods, has it not?—It has been suggested that that should be made universally applicable.

159. Has it not also been suggested that wholesale dealers or manufacturers should be visited, and samples taken?—That has been suggested, and also that the limits of salt permissible in beer should be stated, and that the other ingredients should be specified.

160. Then the payment for the samples of butters especially has also been insisted upon, has it not?—When we were on the special subject of butter, I mentioned that. There seems a doubt whether an inspector can actually go into a shop and take butter without paying for it. If that is the construction of the Margarine Act, that is a point where it differs in an important particular from the Sale of Food and Drugs Act; and I do not myself understand, nor has the Local Government Board received any information as to the difference. If that is the construction of the Act, I imagine it was *per incuriam*, for it could scarcely be intended that a man should not pay under the Margarine Act, whereas he has to pay under the Sale of Food and Drugs Act.

Mr. *Kearley.*

161. But he has to pay under the Margarine Act, has he not?—That is an open point, I think. I only mention that as a thing worth noting, because there is a difference; it is, I

Chairman.

think, an accidental difference, and one which is worth setting right.

162. As I understand it now, complaint has arisen with reference to the transmission of articles after analysis to Somerset House, many people contending that that should not be left in the discretion of the magistrates, but should be open to either party?—That is so; there have been complaints to that effect. I think it is rather rare (as far as the cases have come before me) for the magistrates to refuse, but there have been some who have refused, and the representation made to the Board has been that either party ought to be allowed to require the reference to Somerset House.

Mr. *Colman.*

163. May I ask whether we understand that that has the support of the Local Government Board?—The Board express no opinion upon it. I am only authorised to state facts at present.

Sir *Mark Stewart.*

164. I suppose you have a great many suggestions in regard to the amendments to these Acts, have you not?—Yes, a great many; I have given just the principal of them.

165. Do you find it is a general feeling in the country that something ought to be done?—I think there is a general feeling that the whole question of the Acts is a very large one, and that since 1875 there have naturally cropped up a number of difficulties. The mere fact that so large a number of legal decisions have been given, as I have mentioned (between 60 and 70), shows that, and that there is a general feeling that the question ought to be inquired into.

166. Prior to 1875, there was comparatively little separated milk, was there not?—I suppose that was so.

167. Can you tell the Committee who are the inspectors who generally buy samples to be analysed?—The officers of the local authorities generally, the inspectors of nuisances, I think, or the inspectors of weights and measures, and sometimes the police.

168. But no private individuals send samples to your officials, do they?—None come to us at the Local Government Board; they are sent to the public analyst of each district.

169. Do they come to you afterwards. The samples which are sent privately are those which you see, are they not, as well as those which are sent by the officials?—Each analyst has to report to the authority appointing him, every quarter, all the analyses he has made, whether made for private individuals or for the local authorities, and those are all included in these Returns which I have had the honour of bringing before the Committee.

170. Can you speak of the amount of margarine which is made in this country, and which is imported from abroad?—No, I have no particulars as to that; I believe very little margarine is made in this country. I think the manufactories have to be registered, and there are very few registered, I believe.

171. Could the statistics be furnished to this Committee; can the Board of Trade furnish those Returns officially to the Committee of the amount of margarine imported from abroad?—

No,

Sir *Mark Stewart*—continued.

No, the Local Government Board have not got that. Perhaps the Custom House Department have it; I have no doubt they have in their annual statement the amount imported from abroad, but I do not think there exist anywhere any particulars, nor do I see how they are obtainable, of what is made in this country.

Mr. *Channing.*

172. Is it within your knowledge that 21 manufacturers of margarine in the United Kingdom were registered up to 1892?—That I do not know, that has not come before me.

173. Is it within your knowledge that there has been an enormous increase both in the importation of margarine, and probably also in its manufacture in this country?—That is so, no doubt.

174. Does the evidence before you lead you to believe that there has been an increase in the fraudulent sale to the detriment of the consumer and purchaser of butter adulterated with margarine?—I can speak of course only from these returns, which are sent to us from the local authorities, and from them, as I have said, there has not been an increase in the proportion. So far as these returns show, it has been pretty much as it was in the first five years I have quoted. Taking those series of five years which I have brought before the Committee, the percentage was about 14 in the first five years; it was 18 in the second five years, and it was 13 in the third five years, and during the last two years it has been 15 and 14. So that so far as these figures go, one can only say it went up a bit after the first five years and has gone down a bit after the next five years.

175. Still, there have been very frequent complaints from agriculturists as to the prevalence of these frauds, have there not?—No doubt.

176. Is it not the case that 27 county authorities since the Margarine Act have not instituted a single prosecution under that Act?—That I could not say. The returns sent to the Local Government Board do not discriminate between prosecutions under the Margarine Act and prosecutions under the Sale of Food and Drugs Act. They are all put together in the Reports, therefore I cannot say, but I think it very likely.

177. Have you before you, if so perhaps you will put it into your evidence, the extract from the recent Report of the Local Government Board upon this question. Is it not the case that there are several passages in the recent Reports dwelling upon the great want of action of local authorities in dealing with cases under these Acts?—A great many, and I have mentioned in my evidence-in-chief certain very conspicuous cases.

178. Have you given any evidence as to the opinion expressed in the Reports of the Local Government Board as to the utter inadequacy of fines to check these abuses?—Yes, I have stated that, and I quoted several instances in which they have said so; in point of fact the Local Government Board have had numerous complaints.

179. Is it the case that in the 20th, 21st, and

Mr. *Channing*—continued.

22nd Annual Reports, the Local Government Board express a strong opinion as to the inadequacy of the system of fines in use?—I take it from you that those were the reports. I should think I could find a dozen instances in which the Board have expressed their sense in the matter; but the difficulty is to get the magistrates and legal courts to impose fines, even in flagrant cases sometimes.

180. As to milk and butter, in the case of the use of separated milk, the value of milk for children's food is largely due to the presence of fat, is it not?—No doubt.

181. And the standard of fat in pure milk adopted in England by the Society of Chemists is 2·50, is it not?—I should prefer not answering questions as to the standard; that is rather more a matter for the technical witnesses.

182. Is it within your knowledge that the separated milk contains from a sixth to a tenth part of the ordinary amount of fat contained in pure milk?—The Local Government Board have received numbers of communications from which it would appear that separated milk is of very small nutritive value at all, and whether it is separated milk in its actual form or separated milk in its condensed form, it will not do much good to man, woman, or child who consumes it.

183. Has the Local Government Board expressed any opinion as to a milk standard and the testing of the purity of milk?—No.

184. Are you aware that the milk standards adopted by the United States and in Paris are more favourable to the consumer than those suggested in England?—I am unable to answer that question. There is, however, another point which I meant to deal with in my evidence-in-chief, but I forgot it. It seemed to me, both as to Paris and Berlin, it would be very desirable, if I might suggest, for the Committee to ascertain how the two particular difficulties, which are the crucial difficulties in the administration of the Act, as to milk and butter, have been dealt with. I believe in Berlin and Paris the system is entirely different to ours, but as to those two points, the standards for milk and butter must have been dealt with, and I think it might be of advantage for the Committee somehow to profit by their experience.

185. Can you tell me whether the Local Government Board in any of their reports have expressed any opinion as to the extension of inspectors, and having inspectors under a central authority?—I do not think they have.

Mr. *Kilbride.*

186. Did I understand you to say that with regard to inspectors under the Local Government Board they were subject to no examination whatsoever, but that they simply made a statement of their qualifications, which was put before the Local Government Board, and were not subject to any examination at all?—No; I did not mean to express myself in that way. You are speaking of the public analyst, I suppose.

187. No; I think you talked about inspectors under the Local Government Board?—What I

Mr. *Kilbride*—continued.

said was that all appointments of analysts, speaking of public analysts or inspectors, as far as the Sale of Food and Drugs Act is concerned, are those of the local authorities, not of the Local Government Board. The passage of my evidence which I think you are referring to is one in which I was speaking about the appointment and qualifications of public analysts; and as to that I said that each authority appoints its own analyst, but before the appointment is valid it requires the approval of the Board, and before the Board approve the appointment they satisfy themselves that the analyst possesses certain qualifications, not by examinations, but by testimonials.

188. That is practically my point. What I want to elicit from you is this: that let the analyst or inspector be whom he may, is that gentleman a qualified man?—Certainly, the analyst is; the inspectors are quite a different body.

189. You said something about the standard of water in butter; have you any absolute idea as to what percentage of water ought to be in butter?—No, I should hesitate to express any opinion upon that. Of course we have had various statements made to us.

Mr. *Colston.*

190. I should like to ask whether the deterioration of the quality in milk in hot summers is due to water being added to the milk, or cows drinking more water?—From such representations as the Local Government Board have had, I should say that it is due to the addition of water. As a matter of fact, then milk is dearer, and there is more temptation to add water and eke it out; but that is a matter of speculation as to which I should hesitate to express an opinion.

Mr. *Colman.*

191. On the question of margarine, do you find any difference in that as to the mixture of water in wet or dry weather; is that pretty uniform?—I do not think we can trace that very much; the figures are not sufficiently precise to allow me to answer that question in the negative or in the affirmative.

192. I think you have said that very few samples are acquired except by inspection, and that, practically, private persons do not buy them?—Very few; I can give you the figures. For instance, in the year 1892, which is the last I have at hand, out of 32,447 samples analysed during the year, all but 215 were obtained by officers of local authorities, and the remark in the Report as to that is: "As is habitually the case, a much larger proportion, 38 per cent., of the private than of the official samples was found to be adulterated, since, apart from the fact that inspectors, unless they take especial pains to conceal the object of their purchase, often have superior articles supplied to them, a private individual is unlikely to take the trouble to procure an analysis unless he is pretty sure he is being cheated."

Mr. *Colman*—continued.

193. And 38 per cent. of those cases have been prosecuted and brought to a successful issue, have they?—Thirty-eight per cent. was the amount of adulterated samples in the private cases, whereas in the other cases the proportion was 12·4. In the inspectors' cases the amount of adulterated samples according to the returns was 12·4, and in the private cases it was 38.

194. Now, as to the qualification of the analyst, can you give us any information as to what you require, and to whom the certificates are obtained from as to the qualification?—No, no special requirement has been laid down, but I may say that although the Sale of Food and Drugs Act does not prescribe any special qualification for the analyst, yet the Local Government Board have acted as if the requirement of the Act of 1872 was still in force, which provides specifically "that public analysts shall be possessed of chemical, medical, and microscopical knowledge;" and the Board have expressed an opinion that the following is the evidence which local authorities may properly require as to the candidate for the office referred to possessing the requisite qualifications: (1) Medical Knowledge. Proof that the applicant is duly registered under the Medical Acts to practise as a medical man, or in default of this, proof that he has made a special study of the influence of adulterations on health. (2) Chemical Knowledge. The production of diplomas or certificates given in respect of such knowledge or evidence that the applicant has been engaged and is proficient in chemical research. The following may be accepted as proofs of chemical knowledge: (*a*) to have published good matter on chemical subjects; (*b*) to have practised reputably as a chemist; (*c*) to have worked in a chemical laboratory as assistant for a sufficient length of time and at sufficiently refined work; (*d*) to have good certificates which will stand the test of inquiry; and (*e*) to have passed some of the higher examinations, especially of late years. Then, with regard to microscopical knowledge, proof that the applicant has been engaged in microscopical investigations and is proficient in the use of the microscope." That is, generally speaking, what is required.

195. There is no specific examination or certificate, is there?—No.

196. Would you object to that?—I would not express an opinion upon that. The suggestion was made by the Select Committee of 1874 that the Local Government Board should require from public analysts some practical test of efficiency, and that it might be supplied by a certificate of having passed an examination at the School of Chemistry at South Kensington, but that course has not been adopted.

197. But if this Committee recommend it again, would there be any opposition on the part of the Local Government Board?—No doubt a recommendation of the Committee would have great weight with the Local Government Board.

198. The Committee of 1874, I think, recommended what you just touched upon, that the samples should go compulsorily to Somerset House if required by either party, did they not?—Did

Mr. *Colman*—continued.

Did the Committee of 1874 make that recommendation ?

Sir *Charles Cameron.*

199. Have the Local Government Board no power of veto in regard to the appointments ?—Yes.

200. And who advises the Local Government Board in regard to the fitness of the analysts ?—The scientific adviser of the Local Government Board.

Mr. *Kearley.*

201. Has there ever been any appointment vetoed ?—Yes, several cases; it would be invidious to mention them, but it is the fact.

Mr. *Colman.*

202. I will read this passage from the Report. "In the absence of further information as to any better appeal your Committee suggest that where the analysis of the chemist of the local authority is challenged, the sample which is the matter of dispute shall be analysed at the Laboratory at Somerset House, and that the decision arrived at there be regarded as final ?"—That was not adopted in its entirety, because the decision is not regarded as absolutely final. It is not quite an appeal court, but it is a court of reference.

203. Do I understand that you will hand in a statement of those 60 or 70 decisions of the High Court ?—I said that a list would be prepared in the office with a reference to them.

Mr. *Frye.*

204. Can you give us a single case in which the Local Government Board have vetoed an appointment ?—I think that would be invidious.

205. But I take it that there are such cases ?—Yes. I know of four or five even on the slight search I made yesterday, and I am quite sure I could find others.

206. But, as a general rule, many of the analysts are qualified doctors, are they not ?—They are very highly qualified men, as a rule, I think.

Sir *Charles Cameron.*

207. But these gentlemen who are appointed as analysts by the local authorities have to prove to the satisfaction of the Local Government Board, or their scientific advisers, that they are persons in their profession qualified to fulfil these duties before you approve of them, have they not ?—Quite so.

208. If you are not satisfied that that is the case, the Local Government Board would not approve of them ?—That is so, and in various cases the Board have refused to approve of such appointments.

Mr. *Kearley.*

209. The appointment is subject to approval tion by the Local Government Board, is it ?—Yes.

Mr. *Colman.*

210. Is there any explanation of the figures you gave us as reported against 4,790 proceeded against 3,100 ; what is the reason that 1,600 of those cases which are reported against are not proceeded against ?—Because, I think, in a great many cases those are border cases. For instance, an analyst in reporting a milk case might very well report an addition of 2 per cent. of water, or 1 per cent. of water only. Probably if he did that, a Sanitary Authority or the County Authority would be very shy of taking proceedings on such a very small addition, knowing that it would be a border case, and say, "We will not take proceedings unless we can make pretty sure of our ground, and when it is only an addition of that sort, we prefer not to take proceedings." Then there may be other reasons; it may be a question of hardship as to the particular person ; they may have received information as to a particular vendor; there may be reasons of which, of course, we do not have official cognisance, but reasons which will commend themselves to anyone as to the fact of its being unwise to take legal proceedings in every case in which there is an actual report that the samples are not pure.

211. To put another possibility, assume that in some of these cases the analyst has made a mistake in his analysis, and it is admitted afterwards that he has made a mistake, and the case is not proceeded with, am not I right that the defendant may be put to a considerable amount of expense, and that he has no remedy against the analyst who makes the error as to costs ?—If the case is not taken into court.

212. Yes, if it is withdrawn before it comes into court ?—I should think that would be so, but I have no actual illustration to give of such a case; it does not happen to have come before me.

Mr. *Frye.*

213. Will you give us those districts where the Act has not been put in operation more particularly ?—Of course it is all a question of degree. I would rather not answer that question off-hand.

214. Have you had complaints that it has not been administered in Ireland ?—Ireland does not come under the Local Government Board. For instance, take the district of Newington, in London. For many years a butterman in Newington has been able to water his milk with complacency, knowing that he is certain not to be prosecuted, whereas his neighbour in the next district would be prosecuted if he did anything of the kind. You have those anomalies, which are very unfortunate.

215. Will you give me your opinion as to whether the Margarine Act of 1887 has worked ?—According to the figures, it brought down the percentage of adulteration very suddenly. For five years, from 1882 to 1886, it was nearly 18 per cent.; then in the years 1886 and 1887 it was between 17 and 18 per cent. Then came the Margarine Act of 1887, and it went down suddenly to 10·4 per cent.; but since then it has risen again, and it went up in 1891–92 to 15½ per cent.

Mr. *Frye*—continued.

216. Are you aware that in 1888, when the Act first came into operation, the imports of butter were 1,671,433 cwts., valued at 8,913,045*l.*, and that the imports of margarine in that year were 1,139,743 cwts., valued at 3,268,313*l.*; that in 1893 the imports of butter were 2,327,473 cwts., valued at 12,754,233*l.*, against the imports of margarine for that year of 1,300,033 cwts., valued at 3,656,224*l.*?—I daresay that may be so. Of course, those figures are Customs' figures, and do not specially come within the cognisance of the Local Government Board.

217. And that these figures show that from 1888 to 1893 the margarine remained almost stationary, and that butter has increased in weight some 700,000 cwts., and in value by 4,000,000*l.*; I have the official figures from the Statistical Office?—Just so.

218. There are very few margarine manufacturers in this country, I believe; do you know how many there are?—No, I do not know how many.

219. About half-a-dozen?—I should have thought the number was higher; I have heard it variously stated, I have heard it stated as 21.

Colonel *Bagot.*

220. In your evidence you said there had been a decrease in the adulteration of milk, and that the analyst took a higher standard; can you tell us how the standard was fixed, and how it is fixed now?—Of course, I have common knowledge on the subject from various statements which have reached me; but, if I may suggest, that is a matter which should be dealt with by the technical witnesses.

221. Then you said directly afterwards that 270 cows had been tested, and so on; was the standard based on that, do you suppose?—No; that is quite a recent standard of the officers of Somerset House.

222. For what reason; does that give them an idea of what the standard ought to be?—I think so; they were constantly having samples referred to them and they wanted to get 200 or 300 samples of undoubted genuineness to see how they worked out.

Colonel *Bagot*—continued.

223. In order that this standard might be fixed?—That you had better ask them, I think.

224. Is water in butter considered adulteration or not; I mean would any amount of water in butter be considered by an analyst to be adulteration?—No doubt butter has been in certain cases condemned for excess of water, but that again is rather a question for experts.

Sir *Charles Cameron.*

225. In cases where the analysts of the local authorities are supposed in any way to have erred, there is an appeal under the Act, is there not?—The magistrates may refer to Somerset House, or in points of law of course there is always an appeal.

226. I am not referring to points of law. It was suggested by Mr. Colman, I think, just now that the local analyst might not be satisfied; there is an appeal from the local analyst, I fancy, if the magistrates direct, to the chief analyst at Somerset House; is not that so?—I would not call it quite an appeal; there is a reference to Somerset House; they get the Somerset House opinion, and on that opinion they, in 99 cases out of 100, proceed; but the Act does not exactly make Somerset House a court of appeal on matters of fact, but a court of reference. It may be a small distinction, but it is a distinction.

227. You referred to a district in London where you said the people might water their milk with impunity. Have you had any cases from that district of private individuals bringing the Act into force as they might do?—No; I think not. There is more than one case of the kind. I believe in that particular case last year they took a few samples, though very few in proportion to the population; but there are various other districts in which the Acts are a dead letter.

Friday, 6th July 1894.

MEMBERS PRESENT:

Colonel Bagot.
Sir Charles Cameron.
Mr. Channing.
Mr. Colman.
Mr. Colston.
Mr. Dunbar-Barton.
Mr. Frederick Frye.
Mr. Herbert Gardner.
Mr. Jeffreys.
Mr. Kearley.
Mr. Kilbride.
Sir Mark Stewart.
Colonel Warde.
Mr. Yerburgh.
Mr. Whiteley.

MR. HERBERT GARDNER, IN THE CHAIR.

Mr. HERBERT PRESTON-THOMAS, re-called; and further Examined.

Chairman.

228. AT Question 69 I observe, alluding to the experiment of an officer of your Chemical Department in regard to 273 cases, you give the percentage of "total solids" in milk as from 10·3 to 15·8 per cent. Could you tell the Committee what you mean by "total solids;" is there not a difference between solids not fat and fatty matters, and will you explain the difference?—That figure I understand includes both solids not fat and fat. Those figures were derived from the results of an inquiry made by Professor Bell at Somerset House, and I believe that the whole statement, which is in print, will be published with the Board's Annual Report of this year, and it is very probable that the Somerset House witness would like to put in the statement when he is called.

229. With regard to the adulteration of cream, have you any experience of that; are samples frequently taken?—I should think, speaking generally, samples of cream are rarely taken. In a few instances I remember some adulteration of cream; but it is exceedingly rare for samples of cream as such to be taken by inspectors.

230. Have you found cases of adulteration of cream?—There have been very few indeed in my recollection. I think there have been one or two, but I scarcely remember any.

231. What substances are used for the adulteration of cream?—That I could not say.

232. Could you give us any account under what circumstances and at what time samples of milk are taken for analysis?—I think it must depend entirely on the particular inspector and the authority. Of course there are the samples taken on the one hand under the Act of 1879 at the railway stations; but ordinarily I think the inspector goes to the dairy and buys the sample just as it happens. I have no precise information as to there being any uniform practice, and in fact I am sure there is no uniform practice on the part of inspectors as to the time when they take samples.

Chairman—continued.

233. Can you inform the Committee from your own knowledge and experience what time in the day would be the best period for detective purposes to take the samples; would there not be some time more favourable than another with a view of ascertaining the truth?—That I cannot say, as I apprehend it would vary greatly. In one case the milk might have come from a great distance, and therefore there would be a greater interval after the time of milking. The circumstances are so very varying that I cannot say what would be the best time. Some authorities have taken samples on Sundays. I think it was in Paddington that the vestry suddenly began taking the samples of milk on Sundays, having before then not taken samples on that day, and the amount of adulteration in Sunday milk was exceptional.

234. Has it not been suggested that the early morning would be the best time to take samples for detective purposes?—Not within my knowledge.

235. With regard to the special provision you spoke of just now for taking milk at railway stations under the Act of 1879, the samples are generally taken at the station where the milk arrives?—That is so.

236. It has been suggested that it would be fairer to the farmer if the samples were taken at the station from which the milk cans were despatched; what are the objections to such a proposal?—I should say the effect of limiting the taking of samples to the stations of despatch would be to diminish the facilities which the section was designed to furnish for the discovery of adulteration prior to the delivery of the milk into the hands of the consignee. I believe the ground on which it has been suggested that the samples of milk should be taken at the stations of despatch and not at the stations of arrival, is the possibility of the milk being tampered with *en route*. But, of course, that is a very remote possibility. I think it is exceedingly unlikely that the samples would

Chairman—continued.

be tampered with while they were in the custody of the railway company, considering the difficulty of abstracting the milk and adding water, the difficulty in fact of thieving such a bulky article as milk, which I apprehend would be the object of supplying the water. That is such a very remote possibility, and the detection of it is so very likely, that it is scarcely desirable to make the change on that account. Then there is this consideration: the authorities concerned with the adulteration are not the authorities having jurisdiction at the country station from which the milk is despatched. They do not care whether the milk is adulterated or not, so far as their population is concerned. The population to whom the milk is supplied is the population in London, Manchester, Birmingham, or other big towns, but not the population in the rural districts from which the milk comes. Therefore, to leave it to the authorities of the rural districts to take the samples would be to leave it to people who have no direct interest in the matter, and who would probably not exercise their powers very largely.

237. There would be a difficulty, of course, in putting it in any way under the Local Government Board officers?—I think that would be almost impossible; the Local Government Board has no machinery.

238. I gather you do not think it is possible that milk can be adulterated during railway transit?—I think the possibility is exceedingly remote for the reasons I have given.

239. Has it ever been alleged that frauds of this description have been maliciously perpetrated by officials of the railway companies?—Not to the Local Government Board; at least, not within my knowledge. I remember a case which is reported in a Parliamentary Blue Book, in which I think Mr. Pringle, the Sub-Commissioner of the Royal Commission on Agriculture, noticed the fact that a milk can was tumbled over at a railway station and a large portion of its contents was spilt, and he suggested the possibility, in a case of that sort, of the porter, through whose fault it was spilt, supplying the deficiency by adding water; but that was only a suggestion of a possibility, not a statement of anything that had actually happened. I do not remember any case in which proof was given that adulteration *en route* had actually occurred.

240. Do you know anything of the construction of the milk churns in which the milk is sent up?—I do not.

241. In taking these samples for the purpose of analysis at the station of delivery, no notice is now given to the consignor, I think?—No; and I ventured in my evidence on Tuesday to point out that that is one of the matters which I should think was probably a *casus omissus* when the Act was passed, and that it was only fair there should be some chance for the consignor to have a sample which he could get analysed independently.

242. Do you think it just that any consignor of milk should be placed in the same position as a person from whom an article is purchased for analysis under the principal Act?—I should not go so far as that; because there are a number of

Chairman—continued.

provisions as to the sealing of the sample and other formalities; and as the judge said in the case of Rouch *v.* Hall, it would be absurd to require all those formalities in the case of milk where samples were taken at railway stations.

243. But notice could be given, as you say, to the consignor?—Notice could be given; I see no reason against it; and, indeed, I see every reason in favour of inspectors being obliged to reserve a sample which should be at the disposition of the consignor to enable him to get an independent analysis; that would be only fair play.

244. Have you ever heard of cases in which the first notice given to the consignor, who, it may be, is hundreds of miles away from London, was that he received a notice that he was to appear before a metropolitan police court upon a charge of adulteration?—I never heard of that case; but I can conceive its not being impossible.

245. I believe you have a statement you wish to hand in?—Yes, I have a statement showing all the samples adulterated last year, and an enumeration of the whole of the districts in the country, with the number of samples taken in each. That statement, perhaps, would be useful to the Committee (*handing in the same*).

Mr. *Colston.*

246. I think you said you were not much acquainted with the milk churns themselves; could you tell us how they are generally sealed?—I have only the knowledge of every railway traveller, by seeing them on the platforms. I am afraid I could not answer authoritatively upon that point.

Mr. *Yerburgh.*

247. Upon the question of proceedings being instituted by private persons, I understood you to say in one of your answers on the last occasion that the percentage of reports of convictions in proceedings instituted by private persons was far higher than in those instituted by inspectors?—Yes, of the samples reported as adulterated.

248. You also said this provision of the Act was not taken much advantage of on account of the trouble experienced by persons in putting the Act into operation?—That is so, I imagine.

249. I would like to ask whether you attribute that unwillingness on the part of private persons in any degree to the cost of instituting the proceedings?—Of course one can only form a very speculative opinion as to the motives which induce people to do or not to do things of that kind. The cost varies in different districts. For instance, if I remember rightly, in Bristol, instead of the statutory 10*s.* 6*d.* which the analyst may charge, the town council or city council has agreed with the analyst to analyse samples at 2*s.* 6*d.* a-piece. In that case a private individual cannot complain of having to pay 2*s.* 6*d.* for getting an analysis of any sample; but even there, so far as I know, there have been very few instances of prosecutions by private individuals. I fancy it is due to the natural reluctance

Mr. *Yerburgh*—continued.

reluctance of people to perform an unpleasant duty when there is a public authority that can do the duty.

250. Upon the question of cost, I notice, under Section 12 of the Act of 1875, that where there is no analyst in the district the person instituting the proceedings can come to such an arrangement as regards costs as he and the analyst can decide upon ?—Yes; but that is practically inoperative, because there is now an analyst for every district.

251. I understand you to say in your evidence on Tuesday that there were many districts where an analyst had not been appointed ?—No, I do not think I said that. I said practically an analyst had been appointed for every district, or else an arrangement had been made under Section 11 for the employment of the neighbouring analyst.

252. That is the very point ?—But there are only three or four of those cases. Speaking broadly I think there is an analyst for every district in the kingdom.

253. Upon the general administration of the Act, I understood you to say there was a great variation in different districts as to the vigour with which the Act was administered ?—Enormous.

254. Taking milk, I understand you to say that the proportion was 23 per cent. roughly in London, whereas in Salford and Cardiff it was only three per cent. ?—Are you speaking of the difference of the extent to which local authorities administer the Act, or of the extent of adulteration in samples sent from local authorities ?

255. I will take the first point first, with regard to the variation in different districts as to the number of cases admitted ?—That is enormous. In some districts the Act is practically a dead letter; in other districts it is very efficiently administered, and I think adulterators would find it very difficult to adulterate there.

256. It comes to this does it not; that whenever the Act is efficiently administered, you find the adulterator practically disappears ?—That is putting it rather strongly; I should not put it quite so high as that. I do not think the administration of any law would make the adulterator disappear. Still it has a very remarkable effect in some districts in reducing the amount of adulteration where the Act is efficiently carried out.

257. Upon the matter of pepper and vinegar, I understood you to say that in those particular cases adulteration had practically disappeared, and that it was owing to the effective administration of the Act ?—I would not go quite so far as to say that it was owing to the effective administration of the Act. It is very difficult to say what it was owing to. No doubt the administration of the Act had a very beneficial effect as regards those articles; but as regards sugar, for example, I do not suppose it is the administration of the Act that has made adulteration disappear in the case of sugar, but the fact that sugar is so cheap that it is not worth adulterating, and I fancy something of the same kind might be said with regard to other articles where there has been considerable reduc-

Mr. *Yerburgh*—continued.

tion. With regard to vinegar, I do not think adulteration has disappeared. May I ask the reference to the evidence to which the honourable member alluded ?

258. It was Question 119, put by the Chairman in reference to the non-adulteration of pepper, in which he asked whether you attributed that to the fact that active steps were taken under the Acts against persons who did adulterate ?—Yes; I have no doubt that is so.

259. The effective administration of the Act has practically led to an enormous decrease in the adulteration of pepper ?—I have not a doubt that it has had a very considerable effect.

260. As I understand, the Local Government Board has laid down the average of one sample to every 1,000 persons as the minimum ?—In its communications on the subject of the Act the Local Government Board said that one sample for every 1,000 people was a minimum which at that time they thought might be reasonable. Now that minimum has been attained, taking the whole country through, or I believe more than attained. In London it is one sample for every 530 persons, but in a great many districts that minimum has not nearly been attained.

261. As I understand the Local Government Board are not satisfied with a general average of one in 1,000 for the whole population, but the yrequire it should be one in 1,000 for every district practically ?—That is what the Local Government Board are aiming at. In fact now, when they find that in so many districts much more than that proportion is attained, I think they will go further than that. That of course was the figure which they took in rather the early days of the Act. I am not prepared to speak to the view of the Board on that particular point, but I rather fancy they would now go further.

362. I understood you to say there were 45 districts containing a population of 3,000,000 in which only one sample was taken for every 5,720 persons ?—Yes.

263. I understand the total number of samples taken was 496 ?—Yes; in those particular 45 districts selected as being bad districts *qua* the administration of the Sale of Food and Drugs Act.

264. I take it, according to the average fixed by the Local Government Board, the number of samples for those districts should have been 3,000 ?—I have not worked it out. I dare say that is so.

265. I think you gave us the total number of samples reported against, as compared with the total number of cases brought before the notice of the Local Government Board, and I fancy the total number of convictions, to put it in that way, was a little over 50 per cent. of the total number of cases reported. I am referring to Question 37, where the Chairman asked: "Could you give us any year in which you can state the proportions?" and your reply was, "Taking last year (1893), 4,793 samples were reported against; proceedings were taken in 3,174 instances, and in 2,687 of those fines were imposed" ?—That is so.

266. Roughly, it would be that between 50

Mr. *Yerburgh*—continued.

and 55 per cent. of the cases were convicted?—Yes.

267. So that if the number of samples had been taken according to the average laid down by the Local Government Board, there would have been 3,000 samples, and according to the average of convictions obtained in the cases brought before the notice of the Local Government Board, the number of convictions in those 45 districts should have been 1,500, that is 50 per cent. upon the 3,000; is not that so?—No; because it is 50 per cent. of the cases reported against, not of the samples analysed. Taking last year, 1893, for example, the proportion of cases which were reported against out of the entire number of samples taken was 12·9 per cent. The number of samples to be taken is one in 1,000 of the population, and therefore the proportion reported against would be 12·9 per cent of that.

268. Can you give us the figures of 1893 as to the number of cases brought before the Local Government Board?—Yes; I think I have done so.

269. I have not noticed that in your evidence on the last occasion?—In the statement I have just put in, everything is very completely shown; on the second page of that statement you get all the details. That statement gives very full information.

270. Do I rightly understand that beyond sending circulars to the local authorities to enforce the Act whenever they find the local authority is not putting it into force, the Local Government Board have no further power?—They have no compulsory power. It has been entirely confided to the local authority.

271. They cannot compel the local authority to put the Act in force, nor can they, as I understand, appoint an inspector of their own to collect samples?—No; it is entirely at the discretion of the local authorities.

272. To what cause do you attribute the slackness of local authorities in particular districts in putting the Act into force. I suppose there must be some reason for it?—I am afraid I cannot answer that. I have been very much surprised to find how little is done to put in force the Act. For instance, in various grazing counties, where one would think the suppression of adulteration was of the utmost importance to all the interests of the farmers, and where one would have thought public opinion would make them put the Act in force and suppress adulteration. That applies, as you will find from the list which I have handed in to-day, and which will be printed, to various counties; for instance, Norfolk is one that scarcely does anything at all in the way of enforcing the Act. Norfolk is very largely dependent upon agriculture; of course it is an agricultural county, and one would think that Norfolk was the very place where the Act would be enforced. But it is not. Last year, only 26 samples of milk were taken within the county jurisdiction of the whole of Norfolk. I do not know why that should be so.

273. I notice under the Margarine Act, the form of purchase that is required under the Sale

Mr. *Yerburgh*—continued.

of Food and Drugs Act is dispensed with?—That is so.

274. Do you think that has anything to do with the unwillingness of local authorities to proceed under this Act?—I should think not. There is really no difficulty, as is proved by scores of authorities, when you get a good inspector who knows how to take his sample and does not take it himself in uniform as some people do, but who employs someone else to take it. He may, for instance, send his wife or his boy to buy the sample, and if he knows his work he will get the samples easily enough; there is no difficulty about it.

275. On the matter of fines, I understood you to say that it was impossible by a fine to check these offences?—Yes, that has been commented upon in successive reports of the Local Government Board. There has been extraordinary leniency on the part of magistrates as to fines even where men are summoned over and over again for adulterating milk. I think the leniency may sometimes be ascribed to the fact that it is very poor persons who sell the milk in some instances; but a great many flourishing dairymen get fined, and fined over and over again, and it pays them to continue to adulterate and go on paying the fine.

276. Is there any power of imprisonment except under the clause providing for the case where there is intent to injure health?—No; there is only the power under the general law as to non-payment of fines. I imagine a distress, and so on, would issue in the case of non-payment.

277. Do you think it would have any effect in checking these offences if after a certain number of offences there was given a power of imprisonment without option of a fine?—I should think that possible.

Mr. *Kearley*.

278. All the districts, I understand you to say, have availed themselves of the Act in so far as appointing analysts?—Practically all.

279. You stated that all the analysts were men of good qualification, and you mentioned the qualifications they were expected to possess: I understand those qualifications to be medical, chemical, and microscopical knowledge; are not the medical officers under the Public Health Act frequently appointed, and is not the appointment of analyst frequently compulsorily joined to that of medical officer?—I should say not. I should say in every instance where the medical officer has been appointed analyst, the Local Government Board would satisfy themselves, and do satisfy themselves, as to his qualifications (quite apart from his medical qualification) for that special office of public analyst.

280. That would be as regards his chemical qualifications chiefly, and his microscopical knowledge, I presume?—Yes.

281. The Local Government Board require testimonials, I understood you to say, before assenting to these nominations by the local authorities; could you tell me what those testimonials would be?—The practice is this; when there is a vacancy in the office of public analyst, the local authority notifies that to the Local

Mr. *Kearley*—continued.

Local Government Board, and says they have appointed Mr. So-and-so. Then the Local Government Board forward a form on which the authority is required to state the evidence on which they, as the people primarily concerned, are satisfied as to his qualifications. They furnish a statement of that evidence to the Local Government Board, and on that the Local Government Board proceed to act.

282. Then there is no examination required?—No examination.

283. And no special course of training required to be gone through?—The Local Government Board would require that there should be some evidence of the man having gone through a certain course of training, or of his possessing the qualification. In the case of a medical officer of health, with only the ordinary qualification of a medical officer of health, no matter whether he possesses a public health diploma or anything of that kind, that would not of itself satisfy the Local Government Board as to his fitness to make analyses.

284. I will draw your attention to an appointment of an analyst recently in the Hackney Division, on the death of Mr. Tripe, who was the analyst there. He held the joint appointment of medical officer and analyst, and on his death the Council of the Society of Public Analysts made representations to Hackney that it was very desirable to separate those two appointments, but they none the less compulsorily joined the two appointments, and they made a stipulation that they would appoint a certain gentleman upon the condition that he should show a chemical qualification?—I am afraid I have no knowledge of that particular case. I do not know whether it may have happened since the time I ceased to be in charge of the Public Health Department of the Local Government Board.

285. I state the case because I think the Committee ought to have it before them; this gentleman applied then to the Chemical Society to be elected a member, which would enable him to write after his name, F.C.S., Fellow of the Chemical Society. The only qualification to get into the Chemical Society, as I understand, is to be able to pay the entrance fee and the annual subscription; it became a matter, I am advised, of notoriety that this gentleman was seeking to become a member of the Chemical Society simply in order to qualify in this way, and steps were taken to defeat his object, and he was not elected. I wanted to ask you what would be the opinion of the Local Government Board on a chemical qualification of that character?—Speaking generally, I do not think it would go for anything; I do not think the fact of a man being a member of a society to which he gained admission simply by paying a fee and being elected, would be regarded as of any weight whatever in weighing his qualifications.

286. Could I ask that we should have evidence given to us at some later period as to the chemical qualification that the present analyst for Hackney possesses, or was deemed to be possessed of?—That is a matter I should scarcely like to answer. I understand the question to refer to the qualification of an analyst whose appointment has been approved. That is a question I am not authorized to answer at the present moment. [*Note by the Witness.*—I find that the approval of the Local Government Board has not yet been given to the appointment of any public analyst for Hackney in place of the late Mr. Tripe. H. P. T. *July* 12, 1894.]

287. I quite understand that; but the point I am trying to make is this, that there is not a close scrutiny upon the part of the Local Government Board into some of the qualifications that should be possessed by analysts?—That would not accord with my experience and with what I have ventured to tell the Committee. I do not happen to know anything about the particular case referred to by the honourable member; but as I have said, the appointments are very rigidly scrutinised, and in various cases the qualifications have been held to be insufficient and the appointment has been refused. I do not know in the case referred to what other evidence there was or what were the circumstances.

288. There is a case in connection with the borough of Sunderland where they advertised for a gentleman who was required to hold three appointments combined: First, the medical officer of the borough at a salary of 500*l.* a year; secondly, medical officer of the port at 50*l.* a year; and thirdly, public analyst at a salary of 5*l.* a year. Would that advertisement, or the small estimation put upon the value of that part of the services of this gentleman as public analyst, come before the Local Government Board in any shape or form?—Unfortunately I am aware of that appointment. It is a preposterous thing for a town of the size of Sunderland to pay a man 5*l.* a year for being their analyst, and I think the result is that very few samples are analysed there. But I was going to say that the Act enabling the Local Government Board to prescribe the qualification of analysts did not give them any power of rejection on account of the insufficiency of the salary. The salary is a matter entirely for the local authority to fix. The Local Government Board may require satisfactory proof of competency to be supplied to them, and may give their approval absolutely or with modifications as to the period of the appointment and removal; but not a word is said as to the sufficiency of the salary. I believe the Local Government Board have remonstrated as to the smallness of salary in some cases; but where the local authority has stuck to its guns, the Local Government Board are powerless.

289. Under Section 10 of the Sale of Food and Drugs Act they have the power of sanctioning the removal of an analyst on the recommendation of the local authority; has that ever been exercised, on the score of incompetency, by the Local Government Board?—I do not think so. I should not like to answer with absolute certainty; but not within my knowledge.

290. We have been told that these men are competent at the time of their appointment, and I wanted to ask whether it has ever been brought to the knowledge of the Local Government Board at a later period that a certain public analyst was incompetent, and consequently, on the recommendation of the local authority, the Local Government Board have sanctioned his removal,

Mr. *Kearley*—continued.

removal, because they have power to do so under Section 10?—I do not remember such a case. I cannot say more than that.

291. As regards the general working of the Acts, you have pointed out to us that while in some districts they are working very well, in other districts they are practically a dead letter. In 1884 a circular was sent out by the Local Government Board, I believe?—Yes, in June, 1884.

292. Requesting sanitary authorities to endeavour to put these Acts into force more efficiently; I understand sanitary authorities have power to work these Acts in addition to the local authorities?—Yes; in addition to the authorities appointing the analysts.

293. It was in that circular you suggested this minimum percentage of one sample per 1,000 of the population, was it not?—I remember it was in some circular that the Board did that, and I daresay that was the one.

294. I think you pointed out that possibly owing to the circular the number of samples taken had largely increased; you gave the figures for the year 1884 and the year 1893?—Yes.

295. 1893 showed a very large increase over 1884?—I think my special point about the circular was as to the years 1883 and 1885. There was a sudden jump then. It is impossible to fix exactly the reason for the subsequent increase. There have been various causes at work, no doubt. But there was a sudden jump in that particular year, an increase due to the circular, no doubt. I should not doubt sanitary authorities generally gave much more attention to it afterwards. They had scarcely awoke to the fact that it was part of their business till they received that circular, and after that they have done something in the matter.

296. The Local Government Board has no power to compel defaulting local or sanitary authorities to carry out the Act?—I think that is so; and as a matter of fact, if you tried to compel a local body to do what it does not want to do in a matter in which there are so many formalities, they would do it in a way that would not be effectual.

297. Has there ever been a suggestion made to the Local Government Board that it would be beneficial in the working of these Acts if they were to get power to put these Acts into force themselves, at the expense of the local authority?—I do not remember such a suggestion; but there have been very large suggestions covering almost all such grounds, so that I should think it is very likely that may have been amongst them.

298. The fact is, as I understand, when these local authorities care to disregard the work of the Acts, there is no power to compel them?—No power at all.

299. Of course the Local Government Board are being perpetually reminded of the delinquencies, if I may so term them, of these local authorities through the medium of these quarterly or annual returns which they get, and which are incorporated into the Local Government Board's Report?—That is so.

300. It is steadily under the notice of the Local Government Board that certain authorities are not working these Acts?—Certainly.

Mr. *Kearley*—continued.

301. You gave us some figures pointing out the averages in London and the provinces, and it appears that although the average all over London of samples taken is one sample in every 539 of the population, still, in some districts of London, it is as low as 1 in 5,582, according to your figures?—Yes.

302. Again, in the country, although the general average is one in 847, still in 45 districts you mentioned the average is as low as one sample per 5,720 persons?—Yes.

303. After dealing with the samples that were reported against, and those where proceedings were taken, and those where convictions were secured, there remains a certain number that were dismissed; can you tell us how many of those were dismissed under the warranty clause?—No, that I am unable to do.

304. There is no record of that?—There is no record of that.

305. Then as regards the inadequacy of the fines, it has been pointed out, I understand, repeatedly to the Local Government Board that the inadequacy of the fines is largely responsible for the continuance of adulteration, or rather, to put it the other way about, were the fines larger the amount of adulteration would certainly decrease?—I think so. The Local Government Board have over and over again commented upon that. They have sent extracts of their Report containing the portion relating to adulteration and commenting upon the shortcomings of the worst authorities; that is, those whom you call the worst delinquents; and in those extracts from the reports, over and over again comments have been made by the Board as to the inadequacy of the fines and what has seemed to the Board the extraordinary leniency of magistrates in this particular matter.

306. On the present basis of fines it really pays to adulterate where the disposition to do so exists; that is what it amounts to, does it not?—Of course to sell water at 4*d.* a quart is a most profitable proceeding.

307. You were asked your opinion as to the beneficial effect of inflicting the penalty of imprisonment after repeated offences. I presume you are aware that in the majority of European countries imprisonment is inflicted for the adulteration of butter?—I cannot say that I am acquainted at all intimately with that subject.

308. That brings me to an important point as to the attitude of the Local Government Board in connection with the laws that are prevailing in other countries: does the Board lay itself out in any way to ascertain what are the laws for the prevention of adulteration in other countries, or does it merely concern itself with its operations in the United Kingdom?—I should say that on one or two occasions in the Board's Reports they have referred to what is being done in foreign countries. For instance, they referred a good many years ago, in some detail, to the operations of the Paris Laboratory for the suppression of adulteration, which has an entirely different system from our own; it is an entirely centralised system. But I say generally the Local Government Board mainly concerns itself with the current administration; and it is for that reason that I ventured to suggest on

Mr. *Kearley*—continued.

Tuesday that it would be most important for this Committee to ascertain at any rate from Berlin and Paris, and perhaps some other places, how the particular difficulties have been met (if they have been met) which arise on the Adulteration Acts here, that is to say, the difficulties of standard.

309. I gleaned from the observation you made that there was no systematic enquiry going on on the part of the Local Government Board or a general cognisance of what is going on in European countries for the suppression of adulteration?—I think every now and then we obtain some paper from the Foreign Office of a law passed here or passed there, and notice is taken of that; but I should say generally the current administration in England is what the Local Government Board mainly concerns itself with, and not with the administration abroad.

310. You referred to the inadvisability of inspectors taking samples in uniform. I suppose that would equally apply to inspectors taking samples where they were well known?—Yes, except that an inspector who knows his business does not take them himself.

311. Still there is evidence before us to lead us to believe, I think, that the administration of the Act largely depends upon the way in which the inspectors work it. There is a large percentage of convictions, I understand, where samples are taken in a way that would not beget suspicion in the mind of the vendor?—Quite so.

312. Has it been ever suggested to the Local Government Board that travelling inspectors would largely facilitate the working of these Acts?—No, I do not think that suggestion has been made. I think the notion was that the duty had been committed to the local authorities, and if we could get better local authorities, or get increased activity on the part of local authorities, that was the sort of thing to be aimed at. But I do not think centralising it by the appointment of a Government inspector has been suggested. There are already a good number of Government inspectors for many things.

313. I did not mean the centralisation of the working of the whole Acts, but simply that a power should reside with the President of the Local Government Board of despatching travelling inspectors throughout the country to work the Acts where they are not being worked at present?—I am not authorised to speak for the Local Government Board on that point, but my impression is that the Local Government Board would be very shy of undertaking work of that kind, by which they would be concerned in the actual taking of samples and so on; it might rather confuse the functions of the central authority with those of the local authority.

Chairman.

314. It would necessitate a great increase in the number of inspectors, would it not?—Yes, I think there would be great difficulty about it.

Mr. *Kearley.*

315. You gave us a case, I think, where an inspector was known, or where you assumed that the inspector must have been known, where a sample of milk was purchased which showed

Mr. *Kearley*—continued.

an extraordinary amount of fat and was quite an abnormal sample?—Yes. No doubt they recognised the inspector and put a little, or a good deal, of cream in. It is found, however, in the administration of these Acts, as in the administration of a good many Acts, where you get a really good authority resolute to carry out the thing and intending to carry it out, and that is very well known, adulteration is checked. You do not want so much an improved Act of Parliament as improved administration. If you can get all the authorities to do their work as some of the authorities do their work, it goes very well.

316. I understood you have found the taking of samples of milk in transit advantageous?—It has done wonders, I am sure.

317. Can you give us your opinion as to the probable results of taking samples of other food products at the port of entry. Would it not be likely to be beneficial if it were applied to cheese and goods of that character. My point is that those goods come in in an adulterated form, and then circulate throughout the country, and in those districts where the supervision is not close they are sold with impunity; whereas if inspection were made at the port of entry, perhaps, on information that the merchants could give, very many of those frauds would be nipped in the bud?—Of course, you have the analogy of tea; it has worked excellently as to tea.

318. Partially by inspecting at the port of entry, I presume?—Yes, very largely by inspection at the port of entry. Year after year they seize on a certain number of boxes of adulterated tea. I am not authorised to say what the Local Government Board's view is upon that point, but it is a very important point, and I should imagine that if it was possible for the Customs (as to which I cannot say) to make some such arrangements with regard to other articles coming from abroad, as they have done with regard to tea, it would certainly have the effect of checking adulterated products.

319. It has been suggested that there are certain powers whereby this might be brought about at once. Under Section 8 of the Margarine Act, for instance, it is provided that "It shall be lawful for any officer of Her Majesty's Customs or Inland Revenue, or any medical officer of health, inspector of nuisances, or police constable authorised under Section 13 of the Sale of Food and Drugs Act, 1875, to procure samples for analysis if he shall have reason to believe that the provisions of this Act are infringed on this behalf, to examine and take samples from any package, and ascertain, if necessary, by submitting the same to be analysed, whether an offence against this Act has been committed"?—Yes; but I do not know how far that has been utilised by the Customs. I am not able to speak to that personally.

320. Again, under Clause 2 of the Merchandise Marks Amendment Act, "The Board of Trade may, with the concurrence of the Lord Chancellor, make regulations providing that in cases appearing to the Board of Trade to affect the general interests of the country or of a section of the community, or of a trade, the prosecution of offences under the Merchandise Marks Act

Mr. *Kearley*—continued.

1887, shall be undertaken by the Board of Trade, and prescribing the conditions on which such prosecutions are to be undertaken." That does not refer to taking samples at the port of entry; but under clause 8 of the Margarine Act there is power given to the Customs officers?—Yes. As regards that particular article, but not as regards the article you mentioned just now, namely, cheese.

321. Only as to butter?—Yes.

322. Perhaps you would not be able to give any information as to whether that clause has been worked?—I am afraid I could not answer that. Some representative from the Customs will probably be able to speak to that.

Colonel Bagot.

323. The question of adulteration of cheese was mentioned just now. I do not think you gave us any information on the subject of adulteration of cheese in your evidence on the last occasion, did you?—I do not think I did.

324. Could you give us any information upon that subject; could you say whether cheese is largely adulterated, and if so, in what manner?—I can give information as to the cheese samples reported on last year, 1893. There were 330 samples of cheese examined, and of those, 12 were reported against, chiefly because of their being made from skimmed milk.

325. Would those be English or foreign cheeses?—That I cannot say. One sample contained a trace of lead. I suppose that must have got in by accident from the machine.

Colonel Warde.

326. Is cheese made from skimmed milk held to be adulterated cheese?—That is a contested question; I am afraid I am not able to answer the question.

Mr. *Kearley.*

327. There has been no definition given authoritatively, has there, as to what cheese is?—That is the difficulty.

328. Possibly in those cases which you say were reported against proceedings were not taken?—Out of the 12 samples reported against last year, four penalties were imposed.

329. Would those penalties be imposed on the score of the cheese being made from skimmed milk, or because the cheese was adulterated by margarine?—I cannot say. Sometimes the particulars given in the reports of the analysts are so brief as not to refer to the details, and I am afraid this was one of those cases.

330. Then you cannot say definitely whether the conviction was on the score of the cheese being partly skimmed, or on account of its being adulterated by margarine?—I am unable to say.

331. The various articles under the Sale of Foods Act of 1875, and the Amendment Act of 1879, and the Margarine Act are only purchasable for analysis when they are exposed for sale, except in the case of milk; is not that so?—That is so.

332. You would have to have some amendment, possibly, of that part of these Acts where power

Mr. *Kearley*—continued.

is given for inspection in wholesale warehouses, which is one suggestion made to the Local Government Board?—Yes; but then of course the difficulty with regard to inspection in wholesale warehouses would be this, that when the inspector goes there and wants to buy a pound of something or other, they do not sell pounds in a wholesale warehouse, but they sell by the cwt., it may be, and his character, therefore, would be at once recognised. They might give such a notice of admixture as under the case of Sandys *v.* Small: they might say, everything here is adulterated; and then it would be no use. The inspector's character would be at once recognised in a case of that sort.

333. Still there does appear now to be a disposition quite contrary to that which was evinced in 1872 or 1873 (when the previous Committee sat), on the part of wholesale houses to permit inspectors to have access to their warehouses for the purpose of taking samples; has that come within your knowledge?—That has not come within my knowledge.

334. It has been suggested to the Local Government Board, I understood you to say on Tuesday, that it would be beneficial to have access to bonded warehouses and wharves for the purpose of inspection?—That is a suggestion that has been made to the Local Government Board; but I must be understood as not expressing any opinion upon that suggestion or any of the others. In my evidence on Tuesday I gave a string of suggestions which I distinctly disclaimed endorsing on the part of the Local Government Board in any degree. For instance, I mentioned the suggestion that there should be a standard of milk and so on, but I did not express any opinion as to whether it was advisable or inadvisable.

335. Quite so; I merely ventilated the idea by asking you whether that has not been suggested; I noticed in your evidence on Tuesday you expressed no opinion, but merely mentioned the suggestion?—That was so.

336. On Tuesday some evidence was given which was considered ultimately by the Committee to be of a somewhat technical character; I merely ask you the question formally, whether you have any chemical or technical knowledge with regard to analytical testing?—None at all.

337. If I remember rightly, I took exception to your statement that the lowering of the milk standard by analysts was responsible for the decreased figures in the adulteration of milk; you pointed out that a third of the total samples taken were milk and that of those samples 14 per cent. were adulterated; I understand that that was a falling off from previous figures, and I think you said that in your opinion that was occasioned by the lowering of the milk standard by the analysts?—No; that was an improvement, I think, on the previous figures; that was my point.

338. Quite so; that was the point?—My opinion was given very tentatively; I was quoting an opinion given by the Local Government Board in one of their reports to the effect that it was possible that that might be the reason. Some years ago, some time previous to the

Mr. *Kearley*—continued.

the year 1884, the Society of Public Analysts adopted a minimum standard of 9 per cent. for solids not fat, and 2·5 per cent. for fat, making the total solids 11·5 as the minimum standard for milk. The remark I made, following what had been stated in the Board's Report, was, that it was possible, without putting it higher than that, that the analysts, knowing that a good many samples of genuine milk would fall below those limits, have now practically put their limits somewhat lower, and, for that reason, part of the apparent gain that has been made may be due, not to the better composition or strength of the milk, but to a lowering of the standard.

339. The total of the solids at that time was 11·5 ?—11·5.

340. When was that standard fixed?—I could not say what time they fixed it, but it was some time previous to 1884. It had been in force merely as a standard fixed by the Society of Public Analysts. Whether they adhere to that standard now, in practice or theory, I cannot say.

341. That is the point I wanted to make perfectly clear. I understood you to say that they had lowered the standard; I gather that you are not quite prepared to maintain now that they have lowered the standard?—I gathered it was the practice of analysts; various analysts have told me that they would not report milk that was just short of that standard as adulterated. I have been in communication from time to time with analysts, and I should not doubt that a good many analysts would, at all events, hesitate to condemn milk that was just short of that standard; but I would not put it higher than that.

342. I will put it in another way. The standard fixed by the Society of Public Analysts for milk gave the total solids as 11·5; that was fixed, not in 1884, but in 1874?—I said some time previous to 1884.

343. Quite so; it was, as a matter of fact, in 1874, and the standard to-day of the Society of Public Analysts is 11·5 for total solids; that is to say, it is precisely the same, there has been no alteration whatever?—Really.

344. The alteration that has taken place (and perhaps that is where the misunderstanding has arisen) is that by improved knowledge they were able to transfer an extra half per cent. to the fats; so that, whilst the percentage of total solids remained 11·5, the percentage of fat rose to 3, whereas, prior to this improved method, it was only 2½ per cent.; that was the point I wanted to elicit, for I thought it would be rather dangerous to let it go forth that the public analysts have in any way lowered the standard in regard to milk, for they have not done so; could you give us any idea as to the standard at Somerset House for milk?—I think you had better ask the representatives from Somerset House that question.

345. You mention that in an analysis that had taken place in Somerset House, affecting, I think, some 270 cows, the standard dropped as low as 10·9, and went up as high as 15?—Yes; that was the percentage in regard to individual cows.

Mr. *Kearley*—continued.

346. The reason I asked whether they had any standard was to ascertain what was the happy medium, so to speak?—Of course, the difficulty about having a standard is that, if you take the average of the whole milk as your standard, everything below that average would be condemned as adulterated, when, as a fact, it is not adulterated.

347. Let me ask you one question bearing upon the duties and responsibilities of the Local Government Board in connection with the statistical information they have at hand, or should have at hand. Are you aware that there are fixed standards of milk in the United States, and in some of the continental countries?—I have become aware of them in various States of America, and they differ very much in the various States according to my knowledge; but I would deprecate being asked more about that subject, because it is rather a question, I think, for the Somerset House chemists.

348. I understood you to say in connection with vinegar that there has been an enormous increase of samples taken last year, as compared with the preceding year?—That was so.

349. I think you said that the Local Government Board accounted for that by the increased scrutiny on the part of the inspectors, and that they had come to the conclusion that nothing constituted genuine vinegar unless it was made from malt?—I did not intentionally put it quite so strongly as that. The number of samples that were examined went up from 150 to 1,015, I think; and I said that I thought that was due to the fact of there being a good deal of correspondence in the organs of the Society of Public Analysts, and a good deal of correspondence in the newspapers, about vinegar, and as a consequence of the subject being brought before public attention a great many more samples were taken.

350. The point I want to put to you is as to whether those samples were taken with the view of testing whether the article which was sold as vinegar was vinegar by reason of being made from malt?—That I do not know. There is no sufficiently precise information to enable me to answer that question. The question is really whether, if you ask for vinegar, you must be taken to mean malt vinegar, and whether the inspector always asks for malt vinegar, or whether he asks simply for vinegar. As to that I cannot speak with certainty.

351. In the opinion of the Local Government Board, which, of course, would govern the thing very much, may vinegar be vinegar, and yet be brewed from something altogether different from malt, in the same way that beer may be beer without its being brewed from malt and hops at the present time?—I apprehend, looking at the derivation of the word, vinegar originally came from wine, and secondarily it is made in various ways, as I mentioned, from sugar and water, vinegar plant, and so on. I apprehend the article so produced is vinegar, though not malt vinegar.

352. I suggest that the cases which were proceeded against were cases where malt vinegar had been demanded and vinegar had been handed to the inspector by the vendor which was not of

Mr. *Kearley*—continued.

the nature and quality of the substances demanded; I take it, that would be the offence?—That may be so. I do not see how you could fine a man for supplying vinegar which is not made from malt if you do not ask for malt vinegar; but possibly the inspectors do ask for malt vinegar.

353. You will tell me if you would prefer that the question I am going to ask you should be reserved for Dr. Bell. The question is this: whether it is within your knowledge as to whether Somerset House is working in friendly accord and concert with the public analysts of the country?—That, I think, is a question for the representative of Somerset House to answer.

354. The Local Government Board do not deem it part of their departmental duty to see that Somerset House is in contact with the public analysts of the country, for obvious reasons?—Somerset House has a special statutory power under the Act, and I do not think the Local Government Board would interfere.

355. You were asked on the last occasion by the Chairman at Question 62: "Does not the quantity of water in milk depend very much upon weather conditions?" and you said that it did, and that it was occasioned by water being added in seasons when pasture was scarce, and consequently milk scarce also. I want to clear up that point. That would account, no doubt, for the increased disposition to adulterate; but it would not account for the quantity of water in the milk, from a chemical standpoint, would it?—No, I did not mean that in the least.

356. The answer might read that way and I wanted to make it plain?—I mean when milk is scarce there would be more disposition to adulterate.

357. Have you any opinion as to the effect of pasture on the amount of water that would be contained in genuine milk: would the pasture itself affect the percentage of water in milk that was known to be genuine?—I cannot speak as to that. I know the milk one gets in Switzerland, where there is apparently a very scanty pasture, is the best milk you can possibly get.

358. I was thinking of the watery pastures of Holland: the quantity of milk is large, but I am not sure as to the fat-bearing quality of the milk?—I cannot speak to that.

359. The point was raised as to its being quite consistent with milk being direct from the cow, and consequently pure, that it was quite possible for milk to be of such a low standard that it would be altogether lower even than the lowest standard suggested in Dr. Bell's figures in connection with investigations made by Somerset House; probably you would not care to express an opinion as to the desirability of fixing a minimum standard?—No, nor of fixing a standard at all of any sort.

360. You drew our attention to the fact that in London, especially in districts adjoining each other, the percentages of adulteration or of samples reported upon varied enormously?—Enormously.

361. Can you account for that?—I cannot.

362. In some districts it was as high as 25 per cent., and in districts adjoining as low as

Mr. *Kearley*—continued.

4, or 5, or 6 per cent. In St. James's the figures were very extraordinary, I think?—Yes; that is to say, there are most remarkable contrasts. Without investigating the practice of inspectors in obtaining samples, or knowing what it is, I could not express the least opinion on those very remarkable differences.

363. Still, we might suggest it is rather curious, at all events? It is very remarkable indeed.

Colonel *Bagot.*

364. Does that remarkable difference that you alluded to exist only in London?—No.

365. Is it more in London than anywhere else?—I would not say that. I simply took some London districts which lie next to each other, and which presumably have the same supply, just by way of looking over them and getting out the percentages there, and I found those very remarkable differences among adjacent districts.

366. What I mean is, do not those remarkable differences exist just the same in other towns or other districts?—I should think so; I think all over the country you would get any amount of difference.

367. It does not apply specially to London?—No; I took London only as an illustration.

368. Would it be the fact that in some districts, perhaps close together, within the length of a street of each other, different cows might provide milk which would vary enormously, without any question of adulteration?—As a rule the samples would be in sufficient number to enable you to see that there was something more than the variation of the milk of particular cows; the numbers would be so large where you are going over a number of years, as some of these figures do.

369. I do not quite understand whether you meant you noticed the variation in London to be more than the average variation in different districts throughout the country, or whether you only took London as an example?—I took London as an example.

370. Not specially?—Not as a special example; no doubt I could furnish a score of instances in districts adjoining each other in the country, but I took London as the first instance that came to hand.

Mr. *Kearley.*

371. Of course, the milk in those districts would not be milk representing one cow, but a dairy, consequently there would be an average?—Yes.

372. Therefore, where you have a herd of cows belonging to a dairy, or supplying a dairy company, if there were one very bad cow, it would become merged in the goodness of the others, and consequently an average would be set up?—That would be so, no doubt.

373. The Local Government Board has taken no steps to make investigations on the spot into these peculiar differences; for instance, the Local Government Board have taken no steps to ascertain why the percentage of Lambeth is 47·2 of samples reported, against 46·8 in St. George's, Southwark, and in Lewisham 1·6?—No.

374. Or

Mr. *Kearley*—continued.

374. Or to take Woolwich and Greenwich, which is a better illustration; in Woolwich the proportion was nearly 6 per cent., and in Greenwich it was 22 per cent. ?—Yes.

375. The Local Government Board have taken no steps to investigate the cause of those variations ?—None.

376. They simply accepted the figures, and there the matter has rested ?—Their statutory power is confined in that matter to receiving and chronicling the figures and pointing out the differences; that is all they can do.

377. There is one question I should have asked earlier, and that is as to the effect of the strenuous working of the Act upon the percentage of impugned samples; is it the opinion of the Local Government Board that the percentage of adulteration fell off materially where the Acts are energetically worked. Your figures, I think, support that, do they not ?—Yes.

378. I will just read one or two figures. In the county of Somerset one sample was taken in 1890 per 379 inhabitants, and the percentage of adulteration was as low as 3·6; in Gloucestershire, in the same year, one sample per 770 persons was taken, and the percentage of adulteration was 6·2; in Bedfordshire, one sample per 821 inhabitants was taken, and the percentage of adulteration was 7·1. Then, if we go right away to those districts where the samples taken relatively to the number of inhabitants are very small, we find the adulteration increases in a rapid ratio ?—Yes.

379. For instance, in Derbyshire, where one sample was taken per 3,164 inhabitants, the percentage of adulteration was 17·1; in Oxfordshire, where one sample was taken per 14,963 inhabitants, the percentage rose to 41·7. Those are your figures, are they not ?—Yes.

380. In face of those figures, I want to ask definitely as to whether the Local Government Board is not perfectly well aware that the percentage of adulteration, or rather the diminution of adulteration, is dependent upon the effective working of these Acts ?—I should say that would accord with the general experience of the Local Government Board.

Colonel *Warde.*

381. With regard to the appointment of analysts, is it the case that although there are general regulations laid down as to the qualifications required from candidates for the appointment of analysts, there are none as to the method adopted for testing those qualifications before appointment ?—There is no examination which a candidate for the office of public analyst is required to pass. He has to produce evidence satisfactory to the Local Government Board that he possesses the qualifications. It has been suggested on one or two occasions that there should be some examination that analysts should be required to pass. That suggestion was made by one Parliamentary Committee, but it has not been carried out. The analysts have to satisfy the local authority appointing them, and then satisfy the Local Government Board that they possess qualifications of the nature that I described on Tuesday.

Sir *Mark Stewart.*

382. Are there any rules imperative upon analysts with a view to endeavouring to arrive at their conclusions on the same lines of analytical examination ?—There are no regulations that subject by the Local Government Board.

383. Each analyst may analyse on the method he thinks the most conducive to eliciting the true character of the article which he is analysing ?—Quite so.

Mr. *Kearley.*

384. Arising out of that question, no doubt you would rather that Dr. Bell should reply to it, but I will ask you whether to your knowledge, or to the knowledge of the Local Government Board, there is any attempt on the part of Somerset House authorities to keep themselves in communication with analysts so as to advise them as to the tests that might be used to detect more efficaciously the adulteration that is going on ?—That is a matter, I think, for the representative from Somerset House to speak to.

385. As regards the percentage of adulteration, we have it here recorded that in Manchester and Salford, where they enforce the Acts thoroughly, the percentage of milk adulteration has fallen very low ?—Very low, especially in Salford.

386. That is substantial evidence as to the effect which might be expected from all parts of the country were these Acts efficiently enforced? —Yes.

387. Then, as regards the condensed milk, there was a question as to the injurious effects upon children of being fed upon skimmed milk ? —Yes; there were very strong representations made to the Local Government Board from the medical profession and various other persons as to the injury that was done by the sale of condensed milk containing nothing but separated milk.

Mr. *Colston.*

388. But there is a difference between separated milk and ordinary skim milk; it would not refer so much to skim milk as to separated milk ? —The objection applies to both; but in a greater degree to condensed milk made from separated milk.

389. The difference in the value is very extraordinary ?—Yes; the separator takes, as I understand, most of the nutritious properties out of the milk.

Mr. *Kearley.*

390. As regards the skimmed milk in its fluid form, quite separate from the condensed milk, which is, of course, packed in tins, you stated on Tuesday that the nutriment in skimmed milk was practically altogether wanting. I understood you to say that ?—Are you speaking of condensed milk ?

391. No, of liquid milk, crude milk, not condensed ?—I am not speaking, of course, on that as an expert, and perhaps the chemical authorities will be able to speak to that in a way that I

Mr. *Kearley*—continued.

cannot, but I always understood that there was a considerable amount of nutriment in skimmed milk; for instance, it is used to feed pigs, as I mentioned on Tuesday, very largely in the country, and the pigs get fat on it.

392. There would be all the solids remaining in the skimmed milk other than the fat which was abstracted?—Quite so.

393. And that would be, as has already been mentioned, 8·5 on the standard of the public analysts?—Yes.

394. Now we will go to the question of the condensed milk pure and simple. We will take the skimmed milks first?—I should like, if I may, to place before you this memorial which I referred to. I rather want to emphasize this memorial, because it is signed by such a large number of gentlemen whose names would carry very considerable weight. It is a memorial to the President of the Local Government Board which was received in April of this year. It is not a long one, and perhaps I may read it:—"Our attention having been called to the fact that condensed skim milk is being largely sold as 'condensed milk' or 'Swiss milk,' and having regard to the circumstance that it cannot be distinguished from genuine full cream milk except by chemical analysis, and is therefore frequently used as infants' food by persons ignorant of its true nature, we, the undersigned members of the medical profession, analysts, &c., desire to express our opinion that the matter urgently calls for legislative action. We are informed that as the law at present stands the makers and vendors of condensed skim milk can label it 'condensed milk' or 'Swiss milk,' and shelter themselves from prosecution by printing somewhere on the label in small type, as they please, a more or less obscure intimation that the milk is skim. We think it very desirable that an enactment should be obtained to the following effect: Condensed milk from which any of the cream has been removed must be conspicuously labelled 'Condensed Skim Milk,' in large and legible type, and on labels pertaining to this article the word 'Milk' must not be used unless preceded by the word 'Skim,' or 'Skimmed,' in equally bold type." Without going through the signatures, I may say that this is signed by Dr. Mackenzie, the physician of Queen Charlotte's Hospital, and the visiting physician to the Victoria Hospital for Children; Dr. Lauder Brunton, whose name, of course, everybody knows; Dr. Murrell, of the Westminster Hospital; Dr. Galabin, of Guy's Hospital, and a very large number of other gentlemen of the medical profession of very great eminence, and physicians to nearly all the London hospitals, to the children's hospitals, and so on, besides a certain number of public analysts and other gentlemen.

395. Now, the objection that these eminent men raise to this skim milk, I take it to be a lack of disclosure as to the character of the milk; or does the Local Government Board understand that they are objecting to skimmed milk being sold as condensed milk at all?—No; as I understand this representation, I think they say distinctly that it must be sold

Mr. *Kearley*—continued.

with an adequate notification, and that hitherto it has not been sold with an adequate notification; and the inference is that it has done harm to children whose parents have bought it thinking that it would nourish the children, whereas it has not nourished them.

396. As a matter of fact, there would be no nutriment in skimmed milk or no adequate nutriment such as would support life in a child. It would be a dangerous thing to feed a child on skimmed milk?—That, no doubt, is their opinion.

397. I do not know whether the Local Government Board have an opinion on the matter, but I would suggest this for the benefit of the Committee, that it should be clearly stated of skimmed milk that it is not fitted for feeding infants. That has not been included in that representation from those medical authorities?—No.

398. Then, going on to what are termed full cream milks, which are condensed in the same way, from which none of the fat has been extracted, I suppose the question of falsity of description should be made to apply to those milks as well as to the skimmed milks. For instance, we have on some of the best brands of milk a statement that there is only a small quantity of sugar added, and it is notorious that there is a large quantity of sugar added. Would that come within the range of false description, do you think?—That is a point upon which I should not like to express an opinion.

399. Now, as to the question of the difference between the separated milk and skimmed milk, I think you have emphasized once or twice in your remarks the difference between separated milk; that is, milk, as I understand it, separated by centrifugal process, and skimmed milk, which would be milk skimmed on the old lines, hand-skimmed. Do you think that there is a larger percentage of fat or a less percentage of fat remaining on skimmed milk that has been separated by centrifugal process?——

Chairman.] I think those are questions which had better be put to the scientific witnesses.

Mr. *Kearley.*

400. They have been referred to by Mr. Thomas in his evidence, and I thought I would like to ask him. Then, going away to another subject, the question of pepper: I understood you to say that pepper had ceased to be adulterated now. That is based on the figures of last year?—Yes, on the figures of last year.

401. That is only on those figures. Possibly you will not venture to express, as a fact, that it is so?—No; my opinion is simply derived from those figures which come before the Local Government Board.

402. As a matter of fact, the adulteration of pepper is very rampant at the present moment?—That may be so; but I am only speaking on those figures.

Mr. *Jeffreys.*

403. You said that practically there were no private prosecutions on account of adulteration under the Food and Drugs Act of 1875?—Very few.

Mr. *Jeffreys*—continued.

404. Is not there a great want of some official whose duty it would be to take samples and prosecute in those instances?—Every sanitary authority may empower its officials, and every authority appointing an analyst may empower him to prosecute.

405. That is true, but then these samples are obtained, you said, by the medical officers of health and by the inspectors of nuisances in the various counties. Of course those officers have got a great many other duties to perform. Does the Local Government Board think that they have sufficient time to take samples for the purpose of seeing whether there is adulteration? —Yes. I think that is shown to be so, because in districts where they work the Acts well, there is no difficulty in getting samples taken.

406. But does the Local Government Board know whether there are any officers, such as the police, who are employed where those Acts are put into effect?—Yes; the police are employed in various places, in various counties.

407. Under the chief constable?—Under the chief constable.

408. But what I want to know is this: in those counties where you said practically the Acts were a dead letter, why does not the Local Government Board encourage or urge the authorities to employ more officials to detect this adulteration? —The Local Government Board do urge it, but they do not succeed in some of these cases in making an impression on the local authorities. The discretion is committed to the local authorities; they may enforce the Acts or not as they like, and though they do not say "We will not," they practically do not.

409. May I take it that in all those instances where you said practically the Acts were a dead letter, the Local Government Board have made representations to the county or borough officials?—Generally speaking, yes.

410. And what reply have they got?—The usual reply is that they are considering the matter. We used to have the reply that they did not see why honest tradesmen should be harassed by having samples taken, to which we rejoined that honest tradesmen were much more harassed by being under-sold by people who adulterated next door.

411. The Local Government Board has no power to compel these local authorities to take further steps?—No.

412. Then it would be desirable to give the Local Government Board greater power?—I do not think it is any use forcing them, as I ventured to say in an earlier part of my evidence. If the authority does not want honestly to carry out the Act you cannot force them to do so, and if you try to compel them to do a thing they do not want to do they will not do it with the effect of making their prosecution succeed.

413. But they carry out the Public Health Acts. They can force the borough authorities or the county authorities to carry out the Public Health Acts?—Yes, but then that is a specific matter. If a village is not drained there comes a complaint that it is not drained, and the Local Government Board can issue an order to the sanitary authority to drain that village; but that is a very different matter from issuing an order to them generally to get samples, which involves various formalities, because unless the samples are taken with the utmost care it will be of no avail.

Mr. *Jeffreys*—continued.

414. May we understand then that it is not that more samples are required, but more prosecutions, more officials to take samples for the purpose of detecting adulteration?—I do not think it is more officials, I do not think there is anything to show that the officials are not quite sufficient, but it is the authority who do not order their officials to take samples.

Mr. *Whiteley.*

415. As a matter of fact, it does not cost the authority anything, or not a great deal?—Very little.

416. It does not cost a very great sum, if anything, to order the taking of samples?—The cost is very trifling.

Mr. *Jeffreys.*

417. Of course it is a question of expense, because as long as the police do it it costs the country very little, but if they had a regular official whose duty it was to take these samples in order to prosecute for adulteration, then it would cost a great deal more, I suppose?—You would have great difficulty. If you had an official specially appointed for the purpose, you would increase the difficulty you have now as to recognising his official character. When they recognise his official character, they give him samples which are very much above the average.

418. You mean he would be well known; but is it the fact that the police in taking these samples have to go in uniform?—They do not where it is well managed, they go in plain clothes.

419. And that always should be done?—Yes, and also in some counties, I can only speak from general knowledge, but I know in one particular county, I cannot say with certainty what county it was, they never let samples be taken by the policemen belonging to the particular district or county in which the shop is; for instance, if they wanted a sample taken at (say) Wimbledon they would send a man from Guildford, say, to join the Wimbledon division temporarily to take samples about there, so that he should not be known as a policeman, and he would take them in plain clothes.

420. May I ask you just a few questions on what you said with regard to the pure quality of the milk; let me read you Question 64: "It would act in two ways; first, the hot weather would produce a greater demand on the part of the public" (that is, for milk) "and a lesser supply on the part of the farmer? (*A.*) That would be so." Then the next question is, "The consequence would naturally be that the farmer would have to make up the milk in some way or other? (*A.*) Yes; and of course more milk turns sour the hotter the weather." Of course you are aware that milk may be of very low quality, and yet come straight from the cow?—That was a point which I emphasised especially in my evidence on Tuesday.

421. I did not think you did; I thought that you appeared to infer that this low standard of

Mr. *Jeffreys*—continued.

milk was caused by the farmer making it up with water?—No, I think I must have been misunderstood in that way. My point was this, that there was a greater amount of adulteration; when, in point of fact, pasture was rare, milk was dear, and the natural consequence followed that there was more inducement to the vendor to adulterate.

422. But it would be wrong to call it adulteration because the milk was of a poor quality on account of the poor substance of the feeding stuffs?—Yes; that I pointed out specially.

423. Now, may I ask you if the Local Government Board keeps account of how many cases of adulteration of milk have been detected in the article that comes straight from the farmers as compared with the adulteration in shops?—No; the reports which are received by the Local Government Board do not distinguish between those two classes of cases.

424. Are you aware that by far the greatest number of cases of adulteration take place in shops amongst the dealers?—Yes; although, as I said before, the Local Government Board do not receive full returns as to those, they receive sufficient information on the subject to make them aware of that fact.

Chairman.

425. Would you have any record of the various prosecutions of the consignors?—No, not separate from the consignees.

Mr. *Frederick Frye.*

426. Could you tell me what kind of adulteration takes place amongst the retail shops?—Water only.

427. Water in the milk?—Yes.

Mr. *Jeffreys.*

428. That is the worst kind of adulteration in the case of milk?—The only adulterant in the adulteration of milk, generally speaking, is dilution with water. It is nothing else. When we speak of adulteration of milk it is dilution.

429. You said, I think, in one of your answers, or one of the members of the Committee suggested, that more samples should be taken in transit; but the inspectors have that power now?—They have that power, but it is very unequally exercised. It is exercised in some places and not much in others.

430. The reason, I imagine, that they do not exercise this power is that it is very seldom that the milk, as you said before, is adulterated by the consignors. They find it is not worth while taking those samples because the milk is very seldom adulterated by the farmer?—No, I should not like quite to say that. Such reports as we receive show that there are fewer cases of adulteration of samples taken in transit. They are not nearly so many as in the samples which have been got from the hands of the dairymen, and which have often stood the chance of double dilution.

431. Now, with regard to condensed milk, is it not the fact that most of the adulteration in that connection of milk takes place in the foreign milk which comes to us in the form of a paste, and then has skimmed milk added to it here, and is sold as fresh milk?—That I cannot say.

Mr. *Jeffreys*—continued.

432. Does not the Local Government Board take cognisance of those prosecutions?—The Local Government Board only receive general information as to it; they do not receive information of the details of every prosecution.

Mr. *Frederick Frye.*

433. Does not all the condensed milk contain sugar?—All that I am acquainted with.

434. Would not it be adulterated as much as fresh milk?—I do not know. That is a question I prefer not to answer, as it depends upon the construction of Section 6 (1) and (4) of the Act of 1875.

Mr. *Jeffreys.*

435. Now, with regard to margarine, I think you said that it would be a very difficult thing to enforce colouration?—May I ask what answer you are referring to?

436. You said it was a suggestion which had been made to the Local Government Board, but are you aware that it is coloured at the present time?—Oh, yes.

437. May I ask whether you are aware that, under the Danish Margarine Law of 1891, the colouration is forbidden?—I remember that, under some Danish Act, of which the Local Government Board received a copy from the Foreign Office, colouring was forbidden.

Mr. *Kearley.*

438. Are you aware that butter is coloured at the present time?—No, I am not.

Mr. *Jeffreys.*

439. Now, with regard to coffee, I should like just to ask you a question as to that; you said it was very often adulterated with 70 or 80 per cent. of chicory; may I ask you what is the duty upon coffee as it comes into this country?—Well, that is a question that has not come before me.

Sir *Charles Cameron.*

440. I should like to ask you with regard to a matter which I asked you about before; I asked you whether you could supplement your knowledge upon it; you mentioned, in the last day's evidence, that the number of adulterations in the samples of milk taken in Liverpool amounted to 18 per cent. of the whole, whereas in Manchester they only amounted to 5 per cent., and in Salford to 3 per cent.?—May I ask you what question that is?

441. This question 74; it was 19 per cent. in London; it was 18 per cent. in Liverpool; but, on the other hand, it was only 5 per cent. in Manchester and 3 per cent. in Salford?—That was the number of samples of milk reported against, but not the proportion of milk samples to the whole number of samples.

442. But it is the number of milk samples reported against in that way. On that point I asked you whether you were aware of any difference in the administration of the Acts in Liverpool and in Manchester and Salford to account for this, and whether there was a difference, and that in Manchester and Salford, as I

Sir *Charles Cameron*—continued.

was informed, the samples were taken on their way to the consignee, whereas, as I was informed, that was not the case in Liverpool, and did you consider that that would have any bearing in the way of explaining the difference. You have since, I understand, got some knowledge or information upon that subject?—You were good enough to give me notice of that question, and I obtained information at the Local Government Board. I find that in several of the analyst's reports for the City of Liverpool there are statements to the effect that samples of milk have been taken at railway stations by them on week-days and on Sundays before the cans were delivered to the retailers. The following are the figures in the reports as regards samples at Liverpool taken at railway stations: the report for the quarter ending 31st March 1892 is: samples taken, nine, on week-days; found adulterated, two; samples taken on Sundays, 20; found adulterated, two; for the quarter ending 31st December 1892: samples taken 18, found adulterated, seven; and in the following quarters there were two; and 41 samples taken at railway stations; but those are not separated from the others as regards the proportion of those found adulterated. Therefore I find that in those four quarters 90 samples were taken at railway stations in Liverpool.

443. You did not get any similar information as regards Manchester and Salford?—No, I did not.

444. You did not inquire?—I did not inquire. As your question was limited to Liverpool, I am afraid I limited my inquiry to that.

445. Then it appears that my information on that point was erroneous?—I think it must have been.

446. You have referred in one of your answers to me of the possible causes for the apparently smaller amount of adulteration now as compared with formerly, from the fact that the lower standard had been adopted. Is it a fact, or can you inform us whether the standards adopted at Somerset House are made known to the analyst; I imagine it would be properly done through the Local Government Board?—No.

447. There is no communication made from the Local Government Board to the analysts with respect to the limit?—No; the Somerset House officials have special statutory powers, and they exercise those powers independently of the Local Government Board.

448. I have seen a complaint put forward by the analyst, as to a matter which requires rectification, namely, that it should be the duty of some Government Department to inform them of any form of adulteration that is introduced, such as that to which you referred of lard with cotton seed oil. It is not anyone's duty at the present moment to do that, is it?—No.

449. With regard to tea, you mentioned that there was practically no adulteration of that, and you attributed it to the Customs inspection?—Very largely.

450. The Customs have similar powers, have they not with regard to butter and margarine?—Margarine, yes. I have no knowledge myself how far those powers are exercised, and I apprehend that the Committee would perhaps call someone from the Customs to inform them on that point; I am unable to speak to that.

451. You do not get any reports from the Customs?—No, only as to tea.

452. As to tea, could you give us any information?—This is the report I put in (*handing in same*).

453. Can you give us the sum and substance of that report as to the amount of work done in the way of tea inspection by the Customs and communicated to your Department?—This relates to the year 1892, and to the samples of tea. The total number of samples analysed by the Customs analyst in the year 1892 was 647; of those, 624 were considered satisfactory, and the importations represented by them were accordingly delivered on the certificate of the analyst. Then of the remaining 23 samples, three representing 224 packages, were admitted to home consumption. I suppose that means admitted after they had been reported in consequence of some doubt at first. Eleven samples representing 417 packages were restricted to exportation owing to the presence of exhausted leaves, and to an admixture with other substances, so that those were not allowed at all; nine samples representing 18 packages were destroyed as being decomposed and unfit for food. That is the Customs working of the Act for a year.

454. Under what statutory provision are those results communicated to your Department, or is it merely a matter of courtesy; what I wish to understand is, why you receive reports on that subject, and not as regards margarine?—I am afraid I am unable to answer that question.

455. In your opinion would it be an advantage to have the same system pursued with regard to margarine and other articles which the Customs authorities are empowered to inspect?—I think that might be convenient.

456. It would make your knowledge of the subject more complete, would it not?—Of course, it would enable us to make that part of the report statistically complete which we issue every year. I am afraid I do not know the reasons for that difference, nor do I know the extent of the Customs examination into margarine.

457. Is there any right of appeal to the Local Government Board on the part of individuals in the case of local boards not exercising the powers conferred on them under these Acts?—No. The Local Government Board can only urge them; they have no statutory power to compel.

458. At a public meeting yesterday, I heard this allegation made, that a trader had bought a butter shop in a certain district; that he was subjected to unfair competition by sellers of margarine under the name of butter all around; that the salesman whom he had put in neglected to comply with the terms of the Margarine Act; that he remonstrated with him, but the salesman told him there was no necessity for doing so, because the Act would not be enforced against him, and he made certain charges against the local administration. He said that he insisted on the

Sir *Charles Cameron*—continued.

terms of the Act being complied with and then complained as to the sale of margarine without notice in other shops and he could get nothing done by the local authorities. In such a case there is no right of complaint to you? You have no power to interfere?—The Board have no power to compel; no compulsory powers in a case of that sort.

459. With regard to prosecutions under the first portion of the Act of 1875, which relates to the admixture of ingredients noxious to health, you say that very little has been done in that way?—Very little. There is a difficulty of proving a wilful knowledge which applies to that part of the Act, and which does not apply to the other part.

460. Also in such cases, I presume, there is considerable difficulty in obtaining conclusive evidence as to what is noxious and what is not?—Yes; that would be so, no doubt.

461. I see, in a prosecution in the case of cocoa, which took place in France, it was contended that soda used for the purpose of extracting excess of fatty matter was a poison; that was the contention on the one hand, and on the other exactly the opposite was maintained; has there been any case of that sort, or any prosecution with regard to that here?—Not to my knowledge.

462. Now about your control of public analysts. I understand that the Local Government Board have to sanction the appointments?—That is so.

463. You mentioned that they had vetoed certain appointments, but you thought it would be invidious to specify the names of the cases?—Yes.

464. I think that probably the Committee will agree with you on that. Do you make inquiries with regard to every analyst appointed, or do you simply take it for granted that if an appointment has been made, unless some objection is brought to your notice, it has been a good one?—Oh, no; the statements of qualifications are very rigidly scrutinised. They are invariably referred to the medical officer of the Local Government Board, and constantly it happens that such and such a qualification is enquired into, or if there is a statement that there are such and such qualifications about chemical knowledge, and the chemical knowledge of the person appointed seems to be satisfactory, the Board write and say, "Well, how about his microscopical knowledge, and what evidence have you of that," and then the Local Board send up evidence which satisfies them as to his microscopical knowledge. It is not done as a matter of course, nor are the objections of the Local Government Board founded on complaints to them of inadequacy. They move *ex mero motu*, if they consider, after looking at these qualifications, that the qualifications are insufficient.

465. Without asking for any specific cases, are the cases in which you have vetoed such appointments at all numerous?—No.

466. I have no doubt you have had your attention called to the fact that the Society of Analysts themselves demand that there should be some higher scale or standard of qualifications demanded in the case of public analysts than at present. That was one of the resolutions carried by them?—Yes, I know that they have expressed opinions to that effect.

Sir *Charles Cameron*—continued.

467. Have those opinions or the results been brought to the knowledge of your Board?—I think so, but I have not that in my mind at the present moment.

468. Has it been brought to your knowledge that they very strongly object, in many cases at all events, to the combination of the offices of medical officer of health and public analyst in the same person?—I have heard that objection stated to the Board.

469. But the Board has never refused to sanction it?—The Board have not refused, and as there is no statutory disqualification of medical officers of health at present, I do not think that the Local Government Board would probably feel themselves justified in saying that because a man is a medical officer of health, if otherwise qualified, he ought not to be appointed as public analyst.

470. I wished simply to know whether the matter had been brought to the attention of your Board, and whether there was any official opinion on the subject?—Practically, I think that the matter has been brought to the attention of the Board.

471. You do not agree as to the advisability, or you have not formed any opinion, which is it?—I would rather not express any opinion as to the advisability. I think that the Board's view would be that the statute which says that they shall only satisfy themselves of his qualifications would not enable them to say that they would regard him as disqualified because he holds some other office, assuming that the qualifications are good.

472. Another complaint of the public analysts is that in certain cases the amounts paid for the performance of special duties of public analysts in cases where the medical officer of health holds the same post are absurdly small, and not such as to reasonably remunerate him for his attention to such work; does the Local Government Board take any cognisance of the pay in those cases, or has it anything to do with it?—That is a subject I mentioned before, that this Act, enabling the Board to prescribe the qualifications, does not regard his pay; that is a matter for the authority.

473. But you say the Board is very careful, and of its own motion examines into the qualifications of all the analysts whose appointments it sanctions?—That is so.

474. Have any cases been brought to your knowledge of analyses made by assistants being produced in connection with adulteration prosecutions?—I do not remember any case of that sort being brought before the Local Government Board.

475. Is there any general rule in the court before which such cases go, as to the acceptance or rejection of analyses not made by the analyst himself?—I fancy that must depend on the facts and must be for the judgment of the particular magistrate or court.

476. Of course you have nothing to say in the case of assistants?—Nothing.

Sir *Charles Cameron*—continued.

477. You mentioned the adulteration of pepper as having been gradually put down by the prosecutions that had taken place in connection with it. At the public meeting yesterday, to which I referred, a spice merchant mentioned a case in which a very large amount of what was called pepper dust was put up for sale, the broker could not give a guarantee with it and the sale was postponed; in the meantime the pepper dust was analysed and it contained only one or two per cent. of genuine pepper. This gentleman said that he had brought the matter to the knowledge of the medical officer of health for the district, and nevertheless this large quantity of adulterated pepper dust was sold and placed upon the market. Is there any machinery by which such a case could be reached and the pepper destroyed?—If it was injurious to man it could of course be dealt with under the Public Health Act.

478. Yes; but assuming that it was not. It was what is called pepperine, I think?—There have been plenty of convictions for the sale of that stuff.

479. What I wish to understand is whether there is any machinery by which a mass of adulterated material like that could be got at at the fountain head, on its being brought to the knowledge of the authorities, as was the case in this case, or whether the authorities, knowing that such a mass of adulterated material existed and was about to be put into circulation in the open market, could stop its sale and distribution?—No, I should think they could not. There is no statutory power which would enable them to deal with it if it is not injurious to health.

Mr. *Kearley.*

480. Let me ask you one question on that. There is no power for inspection at the port of entry at the present moment?—No.

481. And were this adulterated pepper detected, it would only be when it is offered by retail shops?—Yes.

Sir *Charles Cameron.*

482. In the case I speak of it was offered for sale in Mincing lane?—Yes.

483. You say there is no machinery by which that could be dealt with?—No.

484. I suppose in your opinion that is an evident flaw in the Act that should be remedied?—Well I do not know. I mean if a man has a lot of pepper that is unfit for human food, and is mixed with dust, and if in any of the many purposes to which pepper is applied it might be used for some purpose, I do not know why you should require the man necessarily to destroy it all.

485. Do you not think it is more desirable that that should be prevented from being sold and distributed to the retailers and then that those retailers who possibly know nothing about it should be prosecuted, do not you think it would be more desirable in the public interest that it should be prevented from being sold for human consumption *en masse*?—I should agree as to that only it struck me that certain difficulties as to analogous cases of that kind might arise, and as to the seizure and destruction of these things the Legislature has always been very tender.

Sir *Charles Cameron*—continued.

486. Well, in the case of tea that course would be adopted by the Customs?—Yes; that course would be adopted by the Customs, but you were speaking of other articles.

487. Yes; I am taking the case of margarine. That course would be, I suppose, adopted by the Customs, too, would it not?—I suppose so, but I do not know what the actual practice is of the Customs officers.

488. In the case of tea it would be?—In the case of tea it would be, undoubtedly.

Mr. *Kearley.*

489. Under Clause 8 of the Margarine Act the Customs have now the power to inspect adulterated butter at the port of entry?—Yes.

490. But in the case of tea, under the powers that the Customs possess already, it would be impossible for adulterated tea to be offered for public sale?—That is so, no doubt.

491. As I understand Sir Charles Cameron's case in connection with pepper, the pepper was offered for sale, and had the provision existed with regard to pepper which already exists in relation to tea, this adulterated pepper would have been liable to confiscation before it was put upon any public market for sale?—Well, that would be so, assuming that this adulteration took place before it was shipped, but if I understand the case, it was pepper mixed up with dust; that may have been the sweepings of some warehouse, and so the adulteration may have come in after it was imported.

Chairman.

492. It was put forward just now that the Local Government Board collected no information as to the procedure of foreign countries with regard to adulteration. Is not it the fact that the Local Government Board obtains from the Foreign Office from time to time information as regards the laws of foreign countries and their procedure in such matters as refer to the duties of the Local Government Board?—That is so to some extent.

Mr. *Frederick Frye.*

493. You said something this morning about the adulteration of sugar?—Yes.

494. Can you describe what sort of adulteration that is?—My point was that the adulteration of sugar had practically vanished, it was no longer adulterated; that is what I said.

495. I was under the impression that you had mentioned a case?—No, I think not; would you show me the answer?

496. It was only given this morning?—No; I had not intended to say so, because, practically, sugar, as I said on Tuesday, is no longer adulterated, so far as these returns show.

497. Is it your opinion that the authorities are rather unwilling to enforce the Margarine Act?—I could not say that, as separate from the Sale of Food and Drugs Act.

Mr. *Frederick Frye*—continued.

498. But when they prosecute the traders, is it not generally under the Food and Drugs Act?—Yes, but then I think there is some question of warranty involved; an invoice is a warranty in the one case, and an invoice is not a warranty in the other, and I think that is the reason for preference, as I have understood it.

499. Is not the form of purchase which is required under the Sale of Food and Drugs Act dispensed with under the Margarine Act to enable the Customs and other inspectors to take samples of goods whilst in transit?—That is so.

500. Are you aware whether all local authorities have carried out the Local Government Board order issued in December 1887 as to the registration of margarine factories? You know they have got an order?—Yes, those are registered with the Local Authorities. There is no machinery for the fact of the registration being notified to the Local Government Board, so that really I can scarcely answer that question. I have incidentally heard of various manufactories being registered, and I think there was a Parliamentary Return on the subject a year or two ago.

501. In a case which occurred at Lambeth, where there was a margarine factory and where the man was summoned for non-registration of his factory, are you aware that he pleaded in defence that the local authorities to whom he applied knew nothing about the Local Government Board order?—I was not aware of that.

502. Can you explain how it is that in certain metropolitan and other districts inspectors are continually visiting the shops of respectable tradesmen and yet omit to visit others who systematically evade the law by selling adulterated goods openly, and who in some instances are giving as much as 24 ounces to the pound?—That of course depends on the control of the inspectors by the authorities under whom they act.

503. Do you think that it would be conducive to honest trading that the Weights and Measures Acts should be amended so as to make it an offence under the Acts for tradesmen to give more than 16 ounces to the pound or any fraction or multiple thereof?—I think that that scarcely comes under the question of the Sale of Food and Drugs Act. That is another matter altogether.

504. Referring to the question of warranty, should not the invoice be in every case a warranty that the goods are as stated thereon, without power to qualify or otherwise?—That is a question on which I should not like to express an opinion. That was merely a suggestion that I said had been made to the Local Government Board, not a suggestion made by the Local Government Board.

Mr. *Colman.*

505. You referred to the payment of analysts, and you said in one instance it had been a question simply of 5*l.*?—That is so.

506. I observe that the Act says in section 11 "and shall make due provision for the payment of remuneration"; are there no means of enforcing that Act?—If you observe, section 11 relates to an authority not having an analyst of its own, but making an arrangement with the analyst of a neighbouring place. That is not an ordinary clause.

Mr. *Colman*—continued.

507. Would not it imply that the borough itself appointing shall make due provision?—Well, I think the clause governing all ordinary appointments of analysts is the previous clause, section 10, where you will see "shall pay to such analysts such remuneration as shall be mutually agreed upon," and therefore that is a little different. The Local Government Board under that have no power as to the remuneration, although they have power as to the qualifications.

508. Is this at all different to usual Acts of Parliament as to appointments? Have the Local Government Board power in other appointments which they have to sanction to determine what the salary shall be?—No; I should say that they have no power to determine generally what the salary shall be. Take the most common case. The most important appointments that come before the Local Government Board are those of the medical officers of health. Well, a sanitary authority must appoint for its medical officer a man with certain qualifications and they may pay him whatever they like. If they pay it all themselves they do not want the Local Government's approval for that; but if they say, Now we want the repayment of half the salary from what used to be the Consolidated Fund, but now from the fund administered by the County Council or the Borough Council: if they say, We want the repayment of half the salary, then the Local Government Board is empowered to stipulate, We will not sanction the payment with a view to repayment unless you pay a proper salary.

509. Have you any knowledge of the highest salary which is paid?—To an analyst?

510. Yes?—I cannot say offhand.

511. I mean corresponding with this 5*l.* which you said was a small sum?—No, I have not. I have one or two notes of some salaries taken incidentally.

512. Would it be possible to have a Return of the payments which are made to the analysts for the different districts?—Well, I think it might be possible, but I am not sure whether it would not be misleading, on this account: a great many analysts are paid only per sample, and not by salary; there would be rather a difficulty in such a Return.

513. Would it not be a guide to the Committee as to what the salary should be of these officers in the future?—Perhaps you would not mind leaving it open: if the Return can be got, I will ask the Local Government Board, but it might be left in that way; I am not quite sure.

514. It strikes me it might be valuable to give this scale, so as to say that the population of a certain number shall pay such a salary, and the population of another number another salary?—I have got a few notes of particular salaries in the large towns; for instance, Liverpool, Birmingham, and Manchester, and then I have got one or two other cases.

515. Of course if they have very small salaries it cannot be expected that they should remunerate

Mr. *Colman*—continued.

remunerate a defendant if the analyst has made a mistake; but if they are in receipt of good salaries, and the analyst has made a mistake, which is occasionally the case, do you not think it fair that the defendant, who has been put to considerable expense, should be repaid by the analyst, or at least by the Local Authority?—Outside his costs, do you mean?

516. Yes; I mean outside his costs?—That would be introducing rather a new principle in law, would not it?

517. But if, on the other hand, the case is withdrawn, and he is not allowed to go into Court, as I notice is sometimes the case (it is said that the case will not be proceeded with by the analyst), is not that unfair on the defendant?—If he has incurred expense I suppose so, but on that I think I should not venture to express an opinion. I do not know what the opinion of the Local Government Board would be on that particular point.

518. Now you have referred to the question of the inspection of tea by the Customs. Is there any means of ascertaining what the cost of that tea inspection is?—I imagine a representative of the Customs will be called as to that particular matter, and he would know. I imagine that he could give you that information better than I can.

519. However, as a matter of fact you have stated somewhere that the tea adulterations now are almost nil?—Yes.

520. And one may fairly assume probably that if there were inspection by the Customs, the prosecutions for adulterations of these articles also would be very materially diminished?—I suppose that may be so.

521. In other words, it would save the retail dealer a considerable amount of trouble and anxiety?—Yes; but I should not like to express an opinion upon the practicability of making a change of that kind.

522. Now one other question on the law in other countries. As to the Margarine Act, there was a statement handed in as to a new United States Butterine Act and the Danish Act. Would there be any difficulty in your obtaining statements of what laws are in force in other countries?—I think it would be a very difficult and intricate matter.

523. There are statements that have been referred to by the Chairman?—Yes, I think I remember that. There is one of the United States. It would involve, of course, the Foreign Office sending a circular to all representatives abroad, and whether it could be put into such a shape as would be of advantage to the Committee is a question.

524. If the Committee thought it desirable, in what way could it be done?—I imagine by application to the Foreign Office to get this information from all Her Majesty's representatives abroad, but as we know from one or two questions which we have had to do with, it is a very difficult matter to obtain such particulars, and a very long matter, and when you get all these laws it is very difficult to so boil the information down as to make it of much practical value.

525. I am afraid the question of the length of

Mr. *Colman*—continued.

time in getting it will not disturb the Committee very much. We are not going to finish in a few days?—No, but I was thinking it would take many months.

Mr. *Frederick Frye.*

526. Would you think it advisable to recommend that an analyst should be appointed exactly as a medical officer of health is appointed now, that is, with half the salary paid by the County Council and half by the Local Authority, so that the County Council should have part control over those officers and see that they carried out their duties?—No, I do not think that could well be done. I am only speaking generally, of course, but the sums allocated to the Local Authorities have been for special purposes, and there would be this difficulty: for instance, now each County Council has an analyst of its own, and they pay him all the salary, and it would introduce a complication and nothing would be gained if you said the County Council is to pay half his salary.

527. But they have a medical officer of health?—No, they have not necessarily a medical officer of health.

528. London has?—A few of them have, but the great bulk of them have no medical officers, and the ones of whom I was speaking were the medical officers of health of sanitary authorities, not of counties; it is those salaries which are repaid.

Mr. *Yerburgh.*

529. I want to put a question to you to clear up that point on which I had not information before me with regard to those 45 districts that I was upon. I left the point for the time. I was wrong in the percentage of convictions upon the number of cases that were brought before the notice of the Local Government Board. On referring to this report I find that the average convictions on the total number of cases brought to the notice of the Local Government Board for 1893 was 8 per cent. Is that so?—I dare say it is so; that would be about it roughly.

530. This is the report [*handing same to the Witness*]?—Yes; *that* is not convictions; *that* is samples reported against.

531. But those are adulterations?—Cases reported as adulterations, but all those cases were not taken into Court. About two-thirds of those, I think, were taken into Court.

532. But I understand that the percentage of cases in which adulteration was found is 8 per cent. in the total number of cases reported to the Local Government Board?—No; it is 12 per cent. odd. It is 12·9, I think.

Mr. *Whiteley.*

533. With regard to the percentage and statistics referred to in Questions 74 and 75, may I ask if they are not somewhat fallacious, so far as increase of activity of the local authorities is concerned. For instance, one local authority may take five samples and find one bad, or 20 per cent., and another local authority may take 50 samples and find 10 bad, or an equal percentage, and yet one local authority might be

Mr. *Whiteley*—continued.

ten times as active as the other; so that really these percentages are not any guide as to the activity of the local authority nor as to the amount of adulteration in the district?—Well, they are some guide as to the amount of adulteration. In the paper which I have put in this morning there is a statement as to each authority throughout England as to the number of samples taken and as to each sample analysed. That will give the information in great detail.

Mr. *Kilbride.*

534. Do you think that more local inspectors are required for the purpose of carrying out this Food and Drugs Act?—No, I think there is an ample number of inspectors, but the fact is that the masters of those inspectors do not give them directions to get samples. It is the authorities and not the inspectors, because every inspector of nuisances, and every inspector of weights and measures, and so on, may obtain samples if his authority instructs him to obtain samples. There are plenty of inspectors, but it is the local authorities that will not set them to work.

Mr. *Kilbride*—continued.

535. Did I understand you to say that the Local Government Board had no authority over the local authority: no compulsory power over the local authority to compel them to put this Act into operation?—That is so.

536. Would you be in favour of giving either to parish councils, or to county councils, power over the local authorities to see this Act put in force?—I would rather not express an opinion on that. Often it is the County Councils who are themselves the delinquents.

Wednesday, 11th July 1894.

PRESENT:

Colonel Bagot.
Mr. Dunbar Barton.
Mr. Bolitho.
Sir Charles Cameron.
Mr. Channing.
Mr. Colman.
Mr. Colston.
Sir Walter Foster.
Mr. F. C. Frye.
Mr. Herbert Gardner.
Mr. Kearley.
Mr. Kennedy.
Mr. Kilbride.
Mr. Lambert.
Colonel Warde.
Mr. Whiteley.
Mr. Yerburgh

SIR WALTER FOSTER IN THE CHAIR.

Mr. RICHARD BANNISTER, called in; and Examined.

Chairman.

537. WILL you tell the Committee what position you hold?—I am Deputy Principal of the Government Laboratory.

538. And you are a Fellow of certain learned societies, as well?—Yes, of the Institute of Chemistry, the Chemical Society, the Royal Microscopical Society; I am on the Council of the Institute of Chemistry, and am also an officer of Public Instruction, France.

539. And you have been a reporter on subjects more or less akin to our Inquiry in France, have you not?—Yes; I was juror at the Paris Exposition in 1889.

540. And you were also a judge of foods at Chicago in 1893?—I was, and also at the Colonial Exhibition, and at the Health Exhibition in London.

541. I believe you have delivered a course of lectures on certain food products?—I have delivered two courses: one, on milk, butter, and cheese supply, and the other on sugar, coffee, tea, and cocoa.

542. And you have had a lengthened experience in the Government laboratory?—I have been there for 31 years.

543. And in that Government laboratory you receive cases for analysis, or specimens for analysis, from different localities?—Yes; both for our ordinary official work, and also for our work under the Sale of Food and Drugs Act.

544. Under the 22nd Section of the Sale of Food and Drugs Act?—Yes. If you will allow me I will tell you what we received last year. From the Customs Department we received 2,137 samples; from the Admiralty 73; from the Board of Trade 557; from the India Office 707; from the Post Office 143; from the Home Office 43; from the War Department 18; from the Trinity House 86; from the Stationery Office 4; from the Office of Works, London and Dublin, 33; from the Colonial Office 2; and references from magistrates 71.

Chairman—continued.

545. That is under the Sale of Food and Drugs Act?—Yes; and parochial samples 15; making together 3,889.

546. Of which how many were under the Sale of Food and Drugs Act?—71. Then from the Inland Revenue Department we received 12,083 samples of tobacco; beer for estimation of drawback, 9,102; beer duty samples, 8,621; beers from public-houses, 2,820; tinctures 5,575; naphtha 773; miscellaneous 5,392.

547. What is the total number of samples?—48,255.

548. I believe you have a Table of the number of specimens referred to you under the Sale of Food and Drugs Act from 1875 to 1894?—Yes.

549. Can you give us a brief analysis of that Table?—Yes, I can. Samples of arrowroot 4, beer 5, bread 7, brandy 4, butter 62, carbolic acid 1, coffee 26, cream 1, flour 3, gin 6, ginger 5, ginger beer 1, ketchup 1, lard 23, lemonade 3, laudanum 1, linseed meal 1, magnesia 1, milk 411, mustard 8, sweet nitre 4, oatmeal 13, ointment 1, peas 2, pepper 29, quinine 4, rum 3, soda water 1, tea 3, vinegar 14, water 2, whiskey 28—total 678.

550. In those 678 specimens submitted to you, in how many did you agree with the previous analysis?—In the case of 474.

551. And you disagreed in how many?—In the case of 188; and 16 samples were sent up for a special purpose, which were not sent up under the Sale of Food and Drugs Act strictly.

552. I notice from this Table that you had by far a larger number of milk specimens than of anything else?—Yes, we had 411.

553. And next to milk came butter?—Yes.

554. And those were really the two principal articles that were submitted to you?—Exactly.

555. Will you tell us now with reference to the milk cases; will you give us the analyses of the milk cases that came before you?—In 311 the

Chairman—continued.

cases we confirmed the decision of the public analysts, and in 96 we disagreed, which is a percentage of disagreement of 23·5.

556. So that in not quite a quarter of the cases you disagreed with the public analysts of the country?—Yes.

557. Could you refer this difference to any particular cause or condition?—I think that the difference is rather more in the interpretation of the results than in the actual mistakes made.

558. That is to say that the analyses made by the public analysts were probably correct, but that their interpretation of the analyses differed from yours?—We differed in the conclusions.

559. In what way would this difference of interpretation arise?—It would arise when we came to the border line between a genuine milk and an adulterated milk, or, put in another way, between a good milk and a poor milk.

560. That is to say, that a poor natural milk was occasionally mistaken for adulterated milk?—I think I have not made myself quite clear. It is practically impossible from the analysis of a sample to tell whether it is a poor milk or an adulterated milk, that is to say, whether it has been a good milk adulterated with water or a poor milk.

561. I quite understand that point. It really comes to this: that a naturally poor milk has been reported as an adulterated milk?—As a rule that is the case.

562. And that gives rise to the difference between you and the public analysts to a considerable extent?—Mainly.

Mr. *Channing.*

563. It accounts largely for the 96 cases in which you disagreed?—Yes.

Chairman.

564. Can you tell us whether you have any methods on which you rely for arriving at that conclusion, any special tests?—The process that we use at Somerset House, after trying every process that we have known, or that has come before us, is what is called the maceration process.

565. Could you describe that process for the benefit of the Committee?—Yes, I can. We take three quantities of milk weighing in each case about 10 grammes. One quantity is for the purpose of estimating the total solids, ash, chlorine, and other determinations of a like kind; the other two are for the determination of the solids not fat, and of the fat. These two are dried almost to dryness, and then treated with hot ether under particular conditions, that is under the best conditions that we know from practical experience will get out the whole of the fat from the solids not fat. When this operation is completed the residue that is left in each of the platinum dishes, the two residues, are dried, and when dried to the constant weight, give us the total weight of the solids not fat. Then the ethereal portion is dried also, and the residue from the ether gives us the fat, so that in our determination we determine the fat, and the solids not fat.

Sir *Charles Cameron.*

566. The fat from one sample, and the solids not fat from the other two?—No, the fact is this: that two of them are controlling experiments, one for the purpose of controlling the other. We have two residues, and two exhaustions with ether, because we always think it necessary in every case of this kind that we should have a duplicate experiment.

Mr. *Kearley.*

567. One gives you the total fat?—No; the two give us the total fat, and the two residues give us the solids not fat.

Chairman.

568. That is the process that you rely upon for estimating the natural condition of milk?—Exactly. Then in the examination of a sample there are certain physical conditions which we have to take into consideration as well, and all those conditions, along with the result of the analysis, are taken together for the purpose of forming a conclusion as to whether water has been added or not.

569. Are you able to arrive at a conclusion with moderate certainty as to whether the milk is a poor milk or a watered milk?—We are not.

570. That is to say, that you cannot distinguish between a rich milk which has been diluted, and a milk coming from a poorly-fed or old cow?—We cannot, except in very special cases.

571. There are different methods of analysis which give somewhat different results, are there not?—Yes; there are.

572. Do those results vary widely?—Not if the examination is conducted properly. For instance, if the coil process be used, it will perhaps give an increase of what is called butter fat of perhaps 0·2 per cent.

573. And the different methods of analysis simply give results equivalent to 3 per cent. of added water?—Somewhere thereabouts.

Mr. *Kearley.*

574. Do you mean the different analytical methods or the results?—You get the results from the analysis, but the method of analysis will give the results in that way.

575. The methods adopted by you in this maceration process?—Not only that, but you also find that if there are six or eight operators, if you try any methods of analysis the operators will differ amongst themselves. I have a paper before me with the results of the examination by certain members of the Society of Public Analysts in 1885, and I find there that in their solids not fat they differ as much as five-tenths of 1 per cent. amongst themselves; and the fat differs to the same extent.

Chairman.

576. You were giving us these figures which varied to the extent of 3 per cent. according to the method of analysis, and that variation would apply to analyses made by you in your laboratory?—Yes, by the different methods.

577. You

Chairman—continued.

577. You are not referring to the analyses of other people, but to the fact that your methods, the different methods applied by yourself, would give results varying to that amount?—No; I was comparing the difference between the coil method and the maceration method. If our work is properly done, it will not vary to the extent of 3 per cent.; but if you use the coil method, and compare it with the maceration method, you might get a variation of 3 per cent.

Mr. *Herbert Gardner.*

578. Are there any other methods?—There are many methods of analysis besides these, but they are mainly used for the purpose of making a determination quickly, which in commercial work it is necessary that you should be able to do.

Chairman.

579. The coil method that you have referred to I think you might describe so far as you can for the information of the Committee?—The coil method, as a method of milk analysis in getting out the fat, depends upon the degree of fineness into which you can get the solids themselves. It has been found that if you take a coil of paper of a certain length and coil it on itself in a certain way, it will take up a certain weight of milk. This is allowed to dry, and then the coil is put into what we call a Soxhlet extractor, treated with ether, and when the fat has been thoroughly separated from the solids not fat, which adhere to the paper, the ether is dried, and the residue is taken and weighed, and that gives the percentage of fat in that particular sample. But there is one inconvenience in connection with this paper coil process: the solids not fat are not estimated at all; the total solids being estimated, and the solids not fat are just the difference between the fat and the total solids.

580. So that you rely rather on the maceration method than on the coil method for extreme exactness?—We have tried them side by side, and we have come to the conclusion that the maceration process is the best method. It is a very tedious method.

581. So that when you have any analysis before you, or when any magistrate has any analysis before him, it is necessary that he should consider the method by which the results have been arrived at?—He ought to do so.

582. Bearing upon this subject, during the last two or three years you have been making experiments, have you not, with regard to the richness of milk or the poverty of milk?—We have.

583. We had brought up before us by the last witness some experiments that you made with 273 cows?—That is quite right, I have the results here.

584. Can you give us a description of that experiment?—We obtained these samples of milk from different parts of the country, and at different times of the year. You will see in the return that everything is given about the feeding of the cows, so that nothing can be said to the effect that the cows were ill-fed; and we sent one of our own reliable assistants down to the farms, so that he saw the cows milked out completely, and the milk was always under his supervision until he got the samples, and had brought them to our own laboratory for examination. In that return we give 273 cases of individual cows and also the results of the examination of 55 churns.

Chairman—continued.

Mr. *Kearley.*

585. Those would be from 55 dairies?—Yes.

Chairman.

586. Would you go on with your description of the experiment in question?—We examined all these samples by the maceration process, and we found that of non-fatty solids the lowest was 7·52, the highest 10·04, and the average 8·90; and so far as the fats were concerned the lowest was 2·43 in two cases, the highest 5·97, and the average 3·99. Then from the 55 churns the lowest was 8·40, the highest 9·70, and the average 8·96; and of the fat solids, the lowest was 2·89, the highest 5·61, and the average 4·00.

587. Then you found practically that the 55 churns yielded better results than the specimens of milk taken from the cows direct?—Yes, because in the churns were mixed together the poor and the rich, and therefore the average would be better.

588. That would be the explanation?—Yes, then of those 273 cows we found that 47 cows gave solids not fat under 8·5 per cent., 101 gave solids not fat under 8·8 per cent., and 174 gave solids not fat under 9·0 per cent.

589. Have you anything more to say about that experiment?—I have taken out the number of cows and heifers that are given in the last agricultural returns as in milk or in calf in the United Kingdom, and I find that the number of cows in milk or in calf in the United Kingdom in the last return was 4,120,451, and if we assume (which I think we fairly can) that these 273 cows are better than the average of ordinary cows, it would show that of these 4,120,451 there would be about 700,476, or 17 per cent., that would give under 8·5 per cent. of solids not fat.

590. That is below the standard?—Yes.

591. What is that standard?—When I am talking of the standard I ought to be allowed a word presently about the difference I make between the standard and the limit. The standard that we are speaking of, and can call the standard for the present, is 8·5.

592. 8·5 of solids?—Solids not fat. Thirty-seven per cent., or 1,524,566, would give solids not fat below 8·8 per cent., and 2,624,727, or 63·7 per cent., would give of solids not fat below 9·0.

593. You referred to a standard and a limit just now. Will you just define what you mean?—The difficulty about a standard and a limit arises in this way. Under the Adulteration of Foods Act, 1875, it is laid down distinctly that if you have milk or any other substance from which nothing has been taken away, and to which nothing has been added, however poor, it is genuine. In the case of milk a large quantity has to be sold in towns quite away from the place

Chairman—continued.

or production, and we do not know its origin; therefore when we get a sample of milk of low quality, the analysts and ourselves (and I think it is very proper that this should be done) fix a limit, so that if there is any milk that falls below that limit, it is for the person to prove or give conclusive evidence to the satisfaction of the court that water has not been added.

594. How is that limit fixed?—It has been fixed on the part of the public analysts in this way: that when the Act of 1872 came into force they took the figures of Mr. Wanklyn, and Mr. Wanklyn's figures were 9·0 and 2·5, that is to say, 9·0 of solids not fat, and 2·5 of fat.

595. Then they adopted that as their limit?—They adopted that as their standard. Then in 1882 it had been found between those two years that by the method of analysis adopted the solids not fat did not give a constant weight; and so in a paper read before the Society of Public Analysts on the 15th of March, 1882, these facts were brought before the Society: "It can hardly be expected that anything very novel can be brought forward in a subject which has been so well ventilated, and which before all others has engaged the attention of public analysts, as milk analysis. But from some statements which have recently been made before us (*see* Mr. W. Johnstone's paper in No. 72 of *The Analyst*) and elsewhere, it appears that not a few analysts have forgotten that the results obtained by the analysis of milk are not results laying claim to absolute scientific accuracy, but are only comparative ones, and that the limits adopted by the Society, 9 per cent. of solids not fat, and 2·5 per cent. of fat, hold good only when each analysis is made in the manner which led to the adoption of these limits; namely, by drying five grammes of the milk for two and a half to three hours over an open water-bath, and by exhausting the residue with from three to six successive quantities of boiling ether. Modifications of this plan have gradually crept in, and concurrently with the adoption of these modifications instances have multiplied in which undoubtedly genuine milk did fall below the Society's limits. Although it cannot be held that the deficiency in solids not fat was in every case due to the modification in the analytical process, it yet appears certain that in many instances the cause lay less with the milk than with the analyst." Then the paper goes on, and it is shown distinctly that as soon as ever you dry to a constant weight the 9·0, in which the sugar of milk is present in a crystalline form, comes down to 8·5, because it is anhydrous, and therefore when the drying is to a constant weight 8·5 is equal to the old 9·0.

Mr. *Kearley.*

596. You have given the increases of solids not fat; would you give the increase of fat?—There is no increase of fat mentioned in the paper, and I shall be able to explain, if necessary, how that has come about.

Chairman.

597. You had better explain that, perhaps?—In going on further with this paper there is no difference at all given in the fat, the fat remains

Chairman—continued.

at 2·5 as the standard; 3·0 was only recommended in 1886.

Mr. *Kearley.*

598. And the total solids are not diminished?—The solids not fat diminish from 9·0 to 8·5, and the explanation is given in a subsequent paper of Mr. Hehner's; he finds that this is due to the fact that the milk sugar that is naturally present in the milk, when dried only for that time, does not give up its water of crystallization, but that as soon as it is dried to a constant weight, then water is given up which is equivalent to about five-tenths of 1 per cent.

Chairman.

599. Have you anything more to say about fat?—I have nothing more to say about the fat, because the fat 2·5 remained.

600. You have mentioned the standard; have you anything to say about limits?—We went carefully over the whole ground. We have made experiments in the meantime and have always dried to a constant weight, and we considered that 8·5 was the point where, if a milk came before us, it was necessary for the vendors to give some explanation about how it was that the milk was so low in solids not fat.

601. That is the line at which you begin to be suspicious as it were of water, and require a proof to be given that there is no water?—Yes, exactly. There is a form of adulteration of milk that is rather common at the present time, and it is a very subtle one; that is, the addition of separated milk to new milk. There is no difficulty in these cases about the solids not fat, because the solids not fat are increased; you will find that the fat will diminish, but the solids not fat will increase. If you find a sample of milk that will contain perhaps from 9 to 9·2 per cent. of solids not fat and fat about 2·7 or 2·8, it is pretty certain that separated milk has been added to that sample.

602. You think that that is a common method of adulteration now?—I think there is no doubt about it.

Mr. *Frye.*

603. What quantity of separated milk is required to bring out those figures?—In bulk do you mean?

604. Yes?—Ten per cent. might do so; it would depend on the quantity of fat in the whole milk to which the separated milk is added.

Chairman.

605. Have you anything more to say about milk analysis?—I think I have gone over that ground; there seems to be nothing further necessary in the direct evidence.

Mr. *Whiteley.*

606. What do you mean by drying to constant weight?—For drying to constant weight the milk is put over a water-bath, weighed, and we keep weighing it till it does not lose any more weight, and then we are quite certain that all the water is expelled. We call that drying to constant weight.

607. Then

Chairman.

607. Then, with regard to butter, you have changes taking place in butter ordinarily when it is kept for any length of time, have you not, which makes some difficulty in analysis?—There is very great difficulty in the analysis of butter.

608. In what way?—Because in keeping the butter it gets rancid, and we find that the insoluble fatty acids increase rather largely and the soluble fatty acids diminish; and inasmuch as when the insoluble fatty acids are high the probability is that foreign fats may have been added, it follows as a matter of course that, if you get a fresh butter to which fat has within certain limits been added, the result of the analysis may be the same as in the examination of an old butter that is perfectly genuine.

609. That introduces confusion and causes a difficulty of detection?—Very great difficulty of detection.

610. Butter was, I think, the next most frequent article submitted to you after milk?—Yes.

611. And the chief difficulty that you find in the butter analysis is the detection of foreign fat?—Just so.

612. Is this introduction of foreign fat a comparatively modern mode of adulteration?—It has been in existence now for a considerable time.

613. In what form is it introduced?—It is rather difficult to say, because there are so many ways of introducing ths foreign fat, but very often it is introduced in the form of oleomargarine.

614. And consequently what is sold as butter is a mixture of this margarine and butter?—Yes.

615. During the last two or three years you have had a good many samples of that kind, I suppose?—Yes; either coming under the Sale of Food and Drugs Act, or that we have obtained for our own examination.

616. Under the Margarine Act?—No, in the open market.

617. Have you anything to say about the analyses of those samples?—A system of adulteration that seems to me to have come into use lately is putting in too much water; that seems the most modern way of adulteration; and there is no doubt that during the last few years there has been a considerable increase in the quantity of water present in particular kinds of butter.

618. That is the most recent form of adulteration of butter, apart from the adulteration of these foreign fats?—Yes, that has come under our notice.

619. The butters that contain an excess of water are very often Irish butters, are they not?—Yes, they are.

620. And this water has been pressed into them for the purpose of adding to the weight, I suppose?—It has been worked in for the purpose of adding to the weight.

621. So that a person buys water and butter instead of butter?—Yes.

622. What is the standard of water in genuine butter?—There is no standard. In fresh butters it will range from about 12 to 14 per cent. But when we come to salt butter it will go up as high as 16 per cent. or a little more; but the watered samples referred to contain sometimes as much as 24 per cent.

Chairman—continued.

623. Twenty-four per cent. of water?—Yes.

624. Have efforts been made to obtain judicial decisions with reference to those adulterations?—Yes.

625. With what result?—Up to the present time the result has been *nil.*

626. You have had no judicial decisions with reference to these adulterations of butter?—Some little difficulty has cropped up in connection with cases submitted to the magistrates, so that really at the present time we have not had one distinct decision upon that particular point.

627. Where do the butters come from chiefly that are adulterated with foreign fats, such as margarine?—Some from France and some from Holland.

628. And from Belgium?—Chiefly from Holland.

Mr. *Frye.*

629. I suppose the water would evaporate after a few days, to a great extent?—No, it will not, because the butter as a rule is in tubs and you cannot get it out.

Mr. *Kilbride.*

630. What percentage of water is there in fresh butter?—From 12 to 14 per cent.

Chairman.

631. That is the normal standard?—Yes, in the best quality of fresh butter.

632. A certain quantity of water is essential in butter?—You cannot make it without.

Mr. *Kilbride.*

633. In salt butter what did you say the percentage was?—16 per cent.; but in some cases it goes as high as 24 per cent.

Mr. *Kearley.*

634. Was there no decision given in the Manchester case as to what should be considered an excess of water?—I did not read that there was a distinct decision given, because there were other matters mixed up in that particular case.

Chairman.

635. Have you anything to say with reference to the analysis of beer; you have had some specimens of beer, I think, submitted to you?—Perhaps it may be interesting to the Committee if I give the number of samples that we examined during the last 10 years.

636. Yes, if you please?—In 1884 we examined 48 samples distinctly for adulteration; in 1885, 106; in 1886, 1,999; in 1887, 2,630; in 1888, 2,027; in 1889, 948; in 1890, 1,956; in 1891, 3,044; in 1892, 3,026; and in 1893, 2,820; making a total of 17,604.

637. There is a great variation in some of those years succeeding one another; can you

Chairman—continued.

account for the variation?—We began to find in 1884–85 that there was a practice of dilution in the public-houses, so our detective staff was used to detect this particular kind of adulteration.

638. Then there was a great fall between 1888 and 1889?—In one year. I cannot account for that unless I look at the documents for the purpose of seeing why it was. The number of samples adulterated was, in 1884, 34; in 1885, 41; in 1886, 624; in 1887, 448; in 1888, 329; in 1889, 275; in 1890, 459, in 1891, 392; in 1892, 620; and in 1893, 498; making a total of 3,720.

639. And the adulterant was generally an addition of water?—The adulterants in all cases were either water only, sugar only, or sugar and water together.

640. And you did not find, as a rule, any other noxious compounds?—We did not find any noxious compounds in one of the samples.

Mr. *Whiteley.*

641. Do you call salt an adulterant?—It depends upon the quantity present in the beer.

Chairman.

642. You did not find an excess of salt in these cases?—We did not find an excess of salt in those cases.

Mr. *Kearley.*

643. The researches made by your detective staff, and by other people, really were for the purposes of revenue; this was a revenue question; it had nothing to do with the Sale of Food and Drugs Act?—It was quite a revenue question.

Mr. *Herbert Gardner.*

644. I think you said that when separated milk was added the usual consequence was that the solids not fat were increased, and that the solids fat were reduced?—Yes.

645. Then I may take it from you, may I not, that it is possible by analysis to know when an adulteration of milk is brought about by the addition of separated milk?—Only within certain limits; you cannot say positively when separated milk has been added in small quantity; and it is a difficult matter to prove the addition at any time.

646. But would the same effect which you have said takes place by the addition of separated milk take place by the addition of water?—No.

647. Then it seems to me obvious that you would be able to tell when separated milk was added rather than water?—There is a very wide difference between being morally certain and being able to prove a case in a court.

648. Can you give the Committee any information as to the nutritive value of separated milk?—The nutritive value of separated milk is high; what you want in connection with that is an addition of fat which can be derived from other sources; and it is a capital thing for bone and tissue.

649. Would it retain its chemical compounds?—Yes; I will give you the constituents of milk, and you will see that is so at once. This is an average analysis of a cow's milk. This is not separated,

Mr. *Herbert Gardner*—continued.

and I will come to separated milk afterwards. It is an average of abont six samples. The fat is 3·81 per cent., the caseine and the albumen 3·20 per cent., the sugar 4·89 per cent., the ash 0·74 per cent., and then the difference is water. When we come to separated milk the fat is reduced from 3·81 to about from 0·1 to 0·25 of 1 per cent. There is scarcely any fat present at all. Then, in the other results which I have given you in the case of pure milk, the caseine and sugar would be slightly increased, because the fat has been taken away from the added separated milk.

Mr. *Kearley.*

650. Practically all the solids not fat would remain and the fat would disappear?—Yes, from the separated milk.

Mr. *Herbert Gardner.*

651. You told us just now as to the standard or limit which has been arrived at in the case of milk, and I believe it is generally understood that there is a great deal of difficulty in arriving at any standard of milk. Have you any information as to any standard arrived at in Paris and other capitals?—I cannot speak of Paris, but I know that in the State of New York the standard they have is considerably higher than the standard in this country.

652. Or in Vienna?—Or in Vienna.

Sir *Charles Cameron.*

653. Do you know what it is in New York?—I believe it is 9·0, as against our 8·5. The 9·0 is estimated in a different way.

Mr. *Channing.*

654. Is that the non-fatty solids?—Yes.

655. And the fat is 3 per cent.?—Yes.

Mr. *Herbert Gardner.*

656. You have told us the different kinds of methods of taking the analysis; have you any information as to the method of analysis which is taken in New York, where 1·9 is obtained?—Babcock's method is the chief one. I have a paper here from the United States Board of Agriculture, and this is the statement that they make now about the method of analysis. This paper was read at a meeting of the Institute of Chemists in 1893 held at Chicago, on August the 24th, 25th, and 26th. The statement is this: "We have now but two official methods," that is to say, of analysis. "One is the Adams paper coil method" (that is the one which I have described), "which is given first place, and the other called the alternate method, devised by Mr. Babcock, except that it directs drying in a tube in a current of air. I understand that Mr. Babcock himself has discarded that method, and now uses what I call the cylinder method. I doubt whether the tubes are now used at all. I think it would be well to substitute the proposed method for the other, and I would also suggest that it be given the first place, as I think it a very much better method than the paper coil method." Babcock, in this second method that he speaks of so very highly, instead of using the paper

Mr. *Herbert Gardner*—continued.

paper coil, uses asbestos, and he says that there is no danger, if you get good asbestos, of the ether taking from it any extractive matter; and that is the method that is now recommended to be used throughout the States.

657. In your opinion is that as accurate a method as that which you employ here?—We cannot take the solids not fat with it.

658. A previous witness has told us something about the quality of milk in connection with hot summers. It is stated that an excessive quantity of water is then present; have you anything to say upon that point?—It is a very difficult matter to say what really causes a cow to give poor milk. For instance, Dutch cows will give a poor milk, and you may feed them as well as you can, but they will never give a rich milk; the cows will give a great quantity, but the quality will be poor.

659. Is it not the fact that milk varies sometimes in richness even on a single farm with the field in which the cows feed?—Yes, and when the cows are feeding together it varies.

660. Now I want to ask you some questions about margarine. First of all I should like to ask you whether margarine is also adulterated by the addition usually of a quantity of water in the same way as butter is?—I have not seen it so adulterated.

661. Have you any information as to the use of preservatives whether for milk or butter. I believe, for instance, that boracic acid is used in milk and salicilic acid in butter?—I know that boracic acid is used in butter.

662. And in milk?—It is used in milk too; boracic acid is better as a preservative, and is more largely used than salicylic acid.

663. Are those substances deleterious at all?—That is more a medical question than a chemical one, and I cannot give an opinion of any value.

664. You can detect their presence by analysis, of course?—Yes.

665. Now some questions about margarine. You are acquainted with the process by which margarine is manufactured?—Yes.

666. Margarine, I think, in its purest form is practically refined beef fat, is it not?—It is, when worked up with milk.

667. Is it, then, fat of the same nature which exists in milk?—Yes.

668. It was found, was it not, when oleo-margarine was first manufactured, that the oleo contained stearine which solidified on the plates and knives of the customers, and thus seriously prejudiced the sale of oleo-margarine as a butter substitute?—Yes.

669. And to remedy this defect the oleo was churned with milk and oil?—Yes.

670. Vegetable oils were used?—Yes.

671. In order to nullify the presence of stearine?—For the purpose of making it assimilate more to the composition of butter.

Mr. *Whiteley.*

672. Is the stearine not expressed first?—In the oleo-margarine, yes; the stearine is separated from the oleo-margarine.

Mr. *Herbert Gardner.*

673. Is there not a tasteless white oil called "arachis," which is devoid of odour, and which by its liquid condition prevents the solidification of the fat?—I cannot answer that.

674. You do not know whether it is used in the composition of margarine?—Not in the composition of the margarine that I have gone into. That is not one of the substances used in it.

675. Are these vegetable oils harmless?—Yes.

676. Some manufacturers, I believe, with a view of rendering the detection of vegetable oils more difficult, add, do they not, a certain quantity of natural butter to the margarine?—Yes, there is no doubt that they do.

677. That is in what you would call, I suppose, the best kinds of margarine?—Some of the margarine mixed with butter is a great deal better than bad butter.

Mr. *Channing.*

678. Is it not necessary in the manipulation and manufacture of margarine to introduce a small proportion of butter in all cases?—Not always; they can sell it without if they like, and they can make it without if they like.

Mr. *Herbert Gardner.*

679. And margarine which is mixed with butter, what you call the better class of margarine, you say is better than bad butter?—Yes.

680. I wish to ask you about the inferior sorts of margarine; you are acquainted with them?—I have seen some; there is no doubt that they are made from bad fat, as indicated by their smell and appearance.

681. And it is made from mutton and pork fat occasionally?—I think that in 1872 or 1875 Dr. Voelcker, speaking before the Select Committee as to this, said that there was no doubt that some of the fat came from knackers' yards.

682. Did I rightly understand you to say that you were not acquainted with the vegetable oils that are sometimes used?—I am acquainted with them.

683. Then I should like to ask you one or two questions about that. Are you aware that the coarse oils of the coco-cotton plant and the palm are sometimes substituted for the more refined tasteless oil that I pointed to just now, called arachis?—I beg your pardon, I misunderstood the question. I have examined samples of that particular oil. It is an earth nut oil.

684. And it is commonly used, being a tasteless oil, to conceal the presence of stearine, is it so?—Yes.

685. But in inferior kinds of margarine coarser oils are used, such as those of the coco-cotton plant and the palm, which are substituted for the finer oils?—And a large quantity of sesame oil is used too, especially in cold weather.

686. And these are mixtures that are sold in the market sometimes as butterine-porcine; have you heard of that, or lactine, or cocoa-butter or lardine; have you heard those expressions used?—Yes, I have heard those expressions.

687. Those represent the inferior kinds of margarine?—Yes, or margarine or lard substitutes.

Mr. *Herbert Gardner*—continued.

688. And those are either mixed with butter or churned with milk, and they make up some of the various compounds sold as margarine as we have heard?—Yes, some of them.

689. What I want to ask you is whether these butters mixed with inferior margarine are deleterious to human health?—There is a very large quantity of margarine used, and I have not heard of anybody being killed or injured by taking it yet; I cannot account for that in any other way than that it is not deleterious. There is no doubt that if the material is sound it is wholesome.

690. But it is easy for you to detect these substances to which I have referred, by analysis; these mixtures of butter and margarine?—Yes; there is no difficuty when they are present in large quantities; it is only when they come just on the border line, in the same way as in milk, that there is any difficulty, only the margin with butter is a little wider than with milk.

691. What percentage is the lowest that it is possible to detect of animal fat in butter?—It is a very difficult question to answer, because very frequently there are certain substances used with the animal fat for a particular purpose, and on account of the presence of those substances you may detect a very small percentage, when if it depended entirely upon the animal fat you could not detect it; you could not say positively that it was there.

Sir *Charles Cameron.*

692. Will you explain that last answer a little more?—Certain of these vegetable oils that are used in the manufacture of margarine have distinct chemical reactions, and if they are present, of course, although the margarine is present in small quantity, the presence of this oil assists you in the determination of the presence of fat.

693. You say that the presence of these oils indicates the presence of fat; but it could not enable you to estimate the percentage of margarine itself, could it?—Very frequently when examining a sample of butter that contains a certain percentage of foreign fat you are quite certain from the analysis that there is something wrong with the butter; that it is either an old butter or something of that kind; but you may get certain indications as you go on in the analysis of the sample that determine you, before you come to an end of your examination, that margarine is really present in the sample of butter.

Mr. *Kearley.*

694. That the fats are not butter fat?—That a certain quantity of the fat is not butter fat.

Sir *Charles Cameron.*

695. I suppose, in connection with the Sale of Food and Drugs Act and the Margarine Act every butter that is an admixture is called margarine?—Yes.

696. No matter what it is mixed with, anything that is manufactured so as to seem to be butter is called margarine?—Yes; it must be called margarine under the Margarine Act.

697. And for the practical purposes of food analysis I suppose that you have not to go into the *minutiæ* of adulteration provided that you found it adulterated with oils or fats?—The difficulty arises from this fact that very frequently you may get a butter containing a smaller or larger quantity of foreign fat that is not called margarine; then you have to examine it for the purpose of seeing whether margarine is present in it.

698. That is the point of your answers about the oils; that the oils indicate adulteration, which of itself even without the animal fat would make the mixture legally margarine?—Exactly.

999. Mr. Herbert Gardner asked you about the use of preservatives for milk and butter, and you mentioned especially boracic acid; I suppose that is in the form of boro-glycerine?—It is generally used in that form.

700. Has it been decided whether the addition of boro-glycerine or boracic acid for the purpose of preserving milk or butter constitutes adulteration?—I am not quite certain; I have got a note somewhere about that, but I fancy that in the last Commission it was recommended that it should not constitute adulteration.

701. But you do not know of any legal decision?—I know of none.

702. There is nothing about it in any of the Acts of Parliament?—No, I have not seen any legal decision upon it.

703. Then I suppose these are other admixtures with butter which have not exactly been decided to be adulteration, such as the addition of colouring matter, anatto and so on?—That has never been considered an adulterant.

704. In the course of your milk analyses or butter analyses, have you come across preservatives such as boracic acid or salicylic acid in appreciable quantities?—Yes, in chemically estimating quantities, but not in large quantities; sufficient for the purpose, no doubt, as a preservative.

705. And you have no reason to believe that they are a more obnoxious preservative than salt in the case of butter; chloride of sodium is of course a preservative?—I think the comparison more a medical question than a chemical one; salt is, of course, a preservative.

706. I ask you, as a matter of fact, would you treat the presence of a little boracic acid, if you found it in butter, differently from the presence of some chloride of sodium?—I should not.

707. You mentioned that in New York the standard of fat which you understood they adopted in milk was 3 per cent.; what is your limit of fat here?—2·75 per cent.

708. Has it been recently increased?—From the results of the examinations that we made of these 273 samples, and seeing the quantity of fat present in those samples, we came to the conclusion that we might raise the limit from 2·5 to 2·75.

709. That is not a standard; that is the limit?—That is the limit.

710. You estimate that fat by exhaustion with ether?—We do.

711. Has there been any method of adulterating milk by the addition of fat so as to counteract the results of cream extraction?—Such a case has not come before me.

712. Do you know whether it been alleged by analysts?—I have not seen any properly authenticated case.

713. But

Sir *Charles Cameron*—continued.

713. But it has been alleged?—Yes, it has been alleged.

714. What was alleged to have been discovered?—The fat was not mentioned.

715. It was not identified?—No.

716. There has never been any case of disputed analysis on that point referred to you?—If I remember rightly we have had one case of milk referred to us which contained starch to make it a little thicker, of course.

717. In appreciable quantities?—We estimated the quantity, I think, at about 1 per cent. That was quite sufficient to thicken it.

Mr. *Kearley.*

718. Was it put in intentionally?—Yes, no doubt.

Sir *Charles Cameron.*

719. Is sugar of milk ever added as an adulterant, or do you attach any importance to its estimation?—We never do estimate it in the analysis of a sample; it goes in the solids not fat.

720. I noticed also that in giving the results of analysis you mentioned the caseine and albumen together; why was that?—The only two points that we give in an ordinary analysis of milk are the solids not fat and the fat, and all those come in the solids not fat.

721. Mr. Herbert Gardner asked you, and another honourable Member asked you, as to the amount of admixture of skim milk with natural milk that would be required to make an appreciable increase in the proportion of solids as compared with a considerable diminution in the fatty process; but that will vary, of course, you said most guardedly, within certain limits. That depends entirely upon the qualities of the two milks?—It depends entirely upon the quantity of fat naturally present in the sample.

Sir *Charles Cameron*—continued.

722. So that if you were to take one of those very samples of which you spoke, where we had 5·9 per cent. of fats, you could add a large amount?—Yes, its whole bulk of separated milk.

723. Without the adulteration becoming apparent?—Yes.

724. I suppose that where you have a low percentage of fat, as in the case where you had only 2·43 per cent., you might consider it adulterated even without the addition of separated milk?—Yes.

725. Is there any proportion between the fats and the solids not fat contained in the milk, or do they vary; may you have a milk rich in fat and low in solids, or *vice versâ*?—Yes, you can, and I will give you an illustration from some samples of milk that we took from a dairy (I will pass the name up to the honourable Chairman in a moment). There was one in which the solids not fat were 8·23 only.

726. That was a good average?—It was below the 8·5; and the fat was 12·52.

727. Was that natural or added?—It was quite natural, because our assistant saw the cows milked; and when you look at the paper and see the origin of the milk you will be sure that it is all right. Then there is another one of 8·32 solids not fat, and 4 09 solids fat. Then there is another of 8·43 solids not fat and 4·59 solids fat.

728. So that the relation between the fats and the solids not fat do not give you anything like a conclusive indication as to the natural or artificial nature of the milk?—They do not.

[*The Witness handed in the following Table:*—]

Mentmore Cows.—Yield of Milk.

Date when Taken.	Date when Examined.	Owner.	Place.	Breed.	Age.	Time from Calving.	Food.	Quantity at Milking.	Time of Milking.	Time of previous Milking.	Condition of Cow.	Specific gravity of Milk.	Percentage by Weight of							Percentage by Volume of Cream.	Remarks.	Fat by Calculation.	Fat by Werner-Schmidt.
													Total Solids direct estimation.	Solids. Not Fat.	Solids. Fat.	Solids. TOTAL.	Casein.	Sugar.	Ash.				
1892.																							
8 Jan.	9 Jan.	Earl of Rosebery	Mentmore	Shorthorn	4 years	3 wks	Mangels, straw and hay, chaff (steamed), hay, 2½ lbs. cotton cake.	5 qts.	2.30 p.m.	6.30 p.m.	Very good	1032·20	13·39	9·04	4·45	13·49	2·86	5·42	·77	·080	11·0	In shed all day	4·67	4·41
"	"	"	"	"	7 "	6 days	"	7 "	"	"	Fair -	1024·07	20·97	8·23	12·52	20·75	2·75	4·75	·73	·086	40·0	"	—	11·7
"	"	"	"	"	9 "	6 wks	"	5½ "	"	"	" -	1030·34	12·30	8·32	4·09	12·41	2·15	5·42	·75	·096	13·0	"	4·08	4·01
"	"	"	"	"	3 "	7 days	"	3¾ "	"	"	Good -	1031·94	17·44	9·28	8·09	17·37	3·07	5·42	·79	·085	22·0	"	—	7·87
"	"	"	"	"	5 "	6 mths	"	3½ "	"	"	" -	1032·90	13·82	8·99	4·75	13·74	3·22	4·97	·80	·101	15·5	"	4·62	4·71
"	"	"	"	14 cows (Shorthorns)	—	—	15 gallons average	—	"	"	—	1031·07	14·33	8·73	5·61	14·34	2·73	5·22	·78	·085	12·5	"	5·54	5·43
13 Jan.	14 Jan.	"	"	Dexter Kerry.	7 years	18 wks	"	2 qts.	"	"	Very good	1029·82	13·04	8·43	4·59	13·02	2·76	4·91	·76	·127	5·5	"	4·68	4·58
"	"	"	"	Kerry -	4 "	12 "	"	3 "	"	"	"	1030·72	13·16	8·57	4·58	13·10	2·78	5·03	·76	·101	4·5	"	4·53	4·64
"	"	"	"	" -	6 "	5½ mths	"	2½ "	"	"	"	1032·84	14·57	9·30	5·14	14·44	3·42	5·09	·79	·106	10·5	"	5·23	5·20
"	"	"	"	Dutch -	3 "	3 "	"	3 "	"	"	"	1031·68	11·93	8·59	3·34	11·93	2·64	5·16	·79	·117	5·0	"	3·34	3·34
"	"	"	"	Jersey -	8 "	12 wks	"	1 "	"	"	"	1024·07	15·09	9·58	5·49	15·07	3·63	5·16	·79	·079	15·5	"	5·51	5·50
"	"	"	"	17 cows (1 Dutch, 1 Dexter Kerry, 3 Jerseys, 4 Kerrys, 8 Shorthorns).	—	—	8½ gallons average	—	—	—	—	1032·38	13·31	8·88	4·24	13·12	2·92	5·16	·80	·101	6·0	"	4·21	4·40

* Not reported.

Sir *Charles Cameron*—continued.

729. Just one other point about the composition of milk; does it not vary greatly according to the period which has elapsed between the calving of the cow and the time of taking the milk?—It does; but, at the same time, you cannot say that it is an invariable rule that such-and-such a thing will happen when the cow has calved so long. For instance, there is that illustration in the Table of 12 per cent. of fat. That cow had only calved six days, and, as a rule, milk is rather low in fat at that time, but that is a remarkably high yield.

730. What I wished to ask you about was this: immediately after calving the milk contains an extra amount of solids, and, I presume, fatty matter?—Yes, it does, of solids which act as a purgative to the calf.

731. And that goes on for a few days?—Yes.

732. Have you tested the milk at that particular period within those few days?—Yes; but it can scarcely be called commercial milk within two or three days of calving, because the physical conditions of the milk are of a kind that you could not use it in an ordinary household as milk.

733. But I suppose that, as soon as it becomes fairly assimilated to commercial milk, it would be mixed with the other milk on the farm?—Yes, certainly.

734. And will greatly add to its richness?—It will as a rule.

735. You mentioned a fact which was perfectly new to me a moment ago, that three weeks after calving milk generally is low as regards its richness?—It does not contain the maximum amount of fat.

736. Does it go up again when the milk begins to dry up?—Generally; but you cannot have an invariable rule about the kind of milk that a cow will give at particular times.

737. In connection with milk analyses, are any adulterants or ingredients made use of for the purpose of hiding a disagreeable taste such as a turnipy flavour?—I have not found it to be the case that anything is added, but local buttermasters do employ such remedies.

738. Have you any reason to believe that the ingredients of condensed milk are at all added for the purpose of bringing up the quality of natural milk?—I have heard of such a thing as condensed unsweetened milk being brought over from the Continent and then used in wholesale houses in large towns for the purpose of bringing up the percentage of solids not fat.

739. But nothing of that sort has come under your notice?—Nothing of that kind has come under my notice.

740. Would you be able to detect that, I suppose, again within certain limits?—Yes.

741. You would require to say that?—Yes, I should be compelled to say that.

742. Because everything would depend upon the normal or abnormal composition of the milk with which the thing was added, and the judiciousness of selection both of the milk and condensed milk?—Yes, and the care with which they manufactured the article, for instance, not exposing it to a very high temperature, because in that case you get the burnt quality directly; but they are careful to condense the milk in a vacuum pan.

Sir *Charles Cameron*—continued.

743. You have had some controversy with the public analysts about your checking of their results, and I wish to bring out exactly, from your point of view, the points on which they find fault with the system adopted at Somerset House and your defence of it. I think it is very desirable for the Committee to understand it. I have here in my hand a letter addressed to your predecessor, Dr. James Bell, dated September 1892, from a very large number of public analysts and chemists, in which they criticise the wording of your certificates. The first paragraph is this: "You cannot but be aware that, for a long time past, many public analysts have been of opinion that the wording of some of the certificates issued by you on disputed samples referred to you under the Sale of Food and Drugs Act is liable to produce an erroneous impression on magistrates and on the public;" and they go on to say, "In the case of milk you sometimes state that you 'are unable to affirm that water has been added';" and they "suggest that in cases which appear to you to be doubtful and in which you consider it probable that water has been added, although your analytical results do not enable you to speak positively upon the point, it would be only fair and proper to add to your certificate that 'the results of the analysis are, at the same time, compatible with the presence of . . . per cent. of added water,' or words to that effect." I should like to hear what you have to say with regard to that suggestion?—I do not want to go into anything controversial if I can help it, but I think that that is due to a misreading of the Adulteration Act, 1875. I think that the analysts have overlooked what power was given under that Adulteration Act. As I said before, so long as any commodity has had nothing added to it or taken from it, it may be of poor quality, but yet at the same time the vending of that particular article is no offence under the Act.

744. And you are a sort of chemical court of appeal at Somerset House?—Exactly.

745. And you consider (personally I entirely agree with you) that it is for you to state if you detect adulteration, but that you have nothing to do in the way of stating that the results are compatible with percentages of added water to what may have been rich samples of milk?—Yes, but we went further than that. We felt sure that we were right so far as the law was concerned, and we submitted the case to the law officers of the Local Government Board and our own law officer also, who came to the conclusion that our certificate would not be legal if we were to make use of the words suggested.

746. As to the controversial matters, we must understand the nature of the controversy, and that is why I wished to clear it up?—If you will allow me, I should like to refer back again to one paragraph of the Report of the Committee on Adulteration, which sat in 1874, on the 1872 Act, because that throws a great light on the particular point raised by the analysts. On page IV. of that Report this statement is made by the Committee under the heading of "Milk."

Sir *Charles Cameron*—continued.

"Too high and rigid a standard has been fixed by some analysts, and no sufficient allowances made for the natural variations in milk. 10 per cent. of milk solids may be more difficult to obtain under certain unfavourable conditions than 12 or 14 under more generous diet, a warmer atmosphere and more comfortable lodging. Not only does the quality of the milk vary with the food, the breed of cattle, the time of year and treatment of the animals; but the milk of one cow of the same breed will differ greatly from that of another, managed under a precisely similar system; and further, the first and last pint of milk which a cow gives at the same milking will present all the difference between an extremely poor and an extremely rich milk. Allowances should therefore be made for these natural variations which some purely scientific chemists seem to have occasionally overlooked." That is in the Report of the Committee itself.

747. There is one point that I think it desirable that the Committee should be informed upon. In the chemical analysis everything is deduction; that is to say, that having got certain facts you have in any case, even in the simplest matter, to work out rule-of-three sums in order to find the result?—Mainly.

748. And in any case of organic analysis you are obliged not merely to introduce your rule of three sums, but to assume a standard from which to work in order to get your percentage?—Yes.

749. So that it is based on assumption, and you are obliged to assume a comparatively low standard in your analysis at Somerset House?—Especially in connection with the power that the Act gives us; we cannot go beyond the Act.

750. It is your business to do justice, not to stigmatise a man as an adulterator unless you are prepared to show that he is such?—Adulteration is a criminal act; so that it must be so.

751. The public analysts, I think, made the same complaint about butter, that your Department recently stated that a sample "practically falls within the limits of the poorest quality of genuine butter met with in commerce, and no evidence is afforded that foreign fat has been added to the butter"; and the analysts suggest that you should in fairness have added: "But the results are compatible with the presence of . . . per cent. of foreign fat in the sample." You would give the same explanation, I take it, in that case?—Yes, that it would be an illegal addition to the certificate.

752. And in the case of an analysis of butter, as in that of milk, you are obliged to assume your standard, and, working out exactly by the same methods the same results, if you assume one standard and the analysts another, you differ, in your conclusions?—Exactly.

753. Now what rights have the public: samples are sent to you regarding which there is a dispute, at the discretion of the Court, are they not?—At the discretion of the Court.

754. And the defender has no right to demand a sample to be sent to you?—No, I think that is one of the weaknesses of the Act.

755. Would you be for allowing the defender in every case to have reference to you?—If he wishes to do so he ought to have the right.

Sir *Charles Cameron*—continued.

756. You think that he ought to have the right?—Yes.

757. Would not that right be availed of in such a case in a very large number of cases?—I think not.

758. If a man has process taken against him for adulteration, has he the right at present on his own account to send you an independent sample?—No, it must come through a magistrate.

759. I have here a case, which I have shown you, which recently occurred in Bristol; it is a milk case, in which a certificate from Somerset House was handed in, and that certificate stated that "after making provision for natural loss arising from change that had occurred in the milk through keeping, we are of opinion that the milk, although of poor quality, does not afford evidence of the presence of added water." Your certificate, in other words, was to the effect that that there was no evidence of adulteration?—It was.

760. And that certificate of yours does not appear in this case to have been accepted as conclusive; why was that?—I was there in the court, so that if you wish to have a full explanation, I shall be happy to give it.

761. I should very much like to have it?—The case came to us in the ordinary way. I cannot be quite certain about the figure, but on Wednesday next I will give you the exact figure. The analyst's certificate (if I remember rightly) was, solids not fat, 7·65. We made our solids not fat 8·22 without allowance for change by keeping, and the fat was right; so we came to the conclusion that there was no evidence of an addition of water to the sample of milk. When the case first came on for hearing, it appears that the analyst's certificate was put in, and there was no further evidence given; but the defendant wished a sample to be sent to Somerset House for analysis. That was done. We sent down our certificate, and in the meantime one of our body was subpœned by the authorities at Bristol to go and give evidence. Our own Board are always very anxious that everything shall be done that can be done to secure justice, quite regardless of expense, and as three of our body had been connected with the analysis of this sample of milk, we went down on that particular day for the adjourned hearing. When we got down there, for some reason or other which I do not understand, our certificate, which was in the court, did not appear to have been accepted, but the objection to it was put in this way: That they could not tell whether the certificate came from our own laboratory or elsewhere, or whether it was signed by clerks, or by whom it was signed. Then, after that, the magistrate and the clerk to the magistrate knew that we were there, but the solicitor for the prosecution would not examine any of us, and did not examine any of us; so at last the solicitor for the defendant had to do so. We were examined by him, and then we were cross-examined by the solicitor for the prosecution. After the evidence had been led, the magistrate came to the conclusion that the case must be dismissed, and he awarded the defendant two guineas costs.

762. But

Sir *Charles Cameron*—continued.

762. But the peculiarity of this case (this is what I want perfectly to understand) appears to me to be that the Somerset House certificate was not accepted?—The argument was that the analyst's certificate was mentioned in the Act of Parliament, and therefore it could be received, but that there was nothing to show that the certificate from Somerset House could be taken as distinct evidence in the case.

763. You have had this Act of 1875 working nearly 20 years, and that you say is a very elementary point that appears not to have been decided?—This is the first occasion of the kind we have had.

764. But at all events a case has never been decided by any superior court, has it?—No.

765. Would it not be necessary to have that point provided against in legislation?—I fancy that when we take this fact into consideration, that the Commissioners of Inland Revenue are referees under the Act, it is surely good law that a certificate sent by their officer should be taken as evidence in a case.

766. That is apparently the intention of the Act of Parliament, but it appears that now, for the first time after all these years, an objection has been taken to the Act not being explicit on the point; is that so?—Yes. I could not understand the case, and I cannot understand it now.

767. You might mention what the case was?—That was a case of milk adulteration.

768. Can you give the name of it; was it against Charles Henry Smith, of Bristol, dairyman, tried in June last?—Yes; it was an adjourned case that we attended.

769. Then, again, there is another peculiarity in this case. I see that you (I think you mentioned it yourself) and some of your colleagues were examined. Now there is no machinery in the Act for requiring your personal attendance, is there?—There is no doubt that if we are subpœnaed we must go.

770. But you would go simply as experts, and not as referees?—It would be as referees.

771. Then you, or the officers of your department, are frequently summoned to attend adulteration cases to which you send in certificates?—Very seldom. I do not think there have been above six or seven cases during the whole time that this Act has been in force.

772. What is your staff, might I ask, at Somerset House?—It consists of two chiefs, two superintending analysts, 12 analysts, and 41 assistants; altogether 57.

773. Your chief duties will lie in connection with excise matters?—And in being chemists to other departments. We do a very large amount of chemical work, for instance, for the India Office on contracts for India in food and other things.

774. One of the points on which the public analysts criticise you most freely is the want of experience which they say holds good in the case of Somerset House; you do not admit that, of course?—We cannot admit that.

775. I have here the report of a discussion that occurred in the Society of Analysts in which that point came up, and they mentioned that you did not have more than 40 or 50

Sir *Charles Cameron*—continued.

appeal analyses to make in the course of a year?—It is not a matter of the number of samples we have on appeal; it is the number of samples we examine: and when you come to milk analysis, if you once understand the method of milk analysis and can do it, you can do 10,000 just as well as you can 100. It is the quality of the work which tells.

776. I suppose also, as a matter of fact, it being your object to obtain as correct data as possible, you often, as in the case of milk to which you referred, make a very large number of analyses for the purpose of arriving at a basis of standard and limits?—Certainly, and we have nearly always got some special work going on in one or other direction in which points are required to be cleared up in connection with analyses.

777. You report certain of your analyses to the Local Government Board, I suppose; do you report all those food and drug cases?—They are taken from our annual report.

778. But the department represented by Mr. Thomas, who gave evidence here the other day, would be informed, I suppose, by your department of the work done by you in connection with the Sale of Food and Drugs Act?—He would get that out of the Commissioners of Inland Revenue's Annual Report, which would be sent on to him.

779. But you have had no direct communication with him?—None, except in special cases.

780. I showed you another case just now, a vinegar case, in which the certificate was handed in from your department. That was as to whether the vinegar stated to be a malt vinegar mixed with 80 per cent. of diluted acetic acid and sold as an article guaranteed to be pure and wholesome, compounded from malt saccharine matter and pure acid, which formed the chemical basis of all vinegar, was guaranteed free from sulphurised acid poisons or deleterious matter; what was your report as to its adulteration?—It was referred to us, I think, as a malt vinegar, and, therefore, we had to examine it to see whether it was a malt vinegar or not. We examined it as accurately as we could, and we came to the conclusion that it was a malt and sugar vinegar to which acetic acid had been added.

781. How do you estimate your percentages here; how do you differentiate between the malt and sugar vinegar and the acetic acid?—The acetic acid is nothing in the world but acetic acid and water, and contains no mineral matter at all. When we come to sugar it contains a certain quantity of mineral matter, but a different kind and quantity of mineral matter from what is found in malt; and then from the composition of the sample, from the distillate, and from other physical appearances and indications (we take them all together), we come to a conclusion as to what quantity of acetic acid has been added to the particular sample. We came to the conclusion, if I remember rightly, that in that case one-fourth part of acetic acid had been added.

782. Again, here a great deal would turn in assumptions, would it not, in such an analysis. I notice that you speak of the amount of phosphoric acid?—That would come from the malt.

Sir *Charles Cameron*—continued.

783. And from the amount of phosphoric acid you would estimate the malt?—Yes.

784. Was the other saccharine matter nitrogen?—The nitrogen would come from the albuminoids, and in this case you will find also that there is alcohol present, too, if I remember rightly.

785. But I suppose that pure malt vinegar would vary considerably in the amount of alcohol and phosphoric acid?—It all depends upon the question of the composition of malt vinegar, because malt vinegar is made now from malt and grain; it is not made from malt only.

786. Do you think that a pure malt vinegar is not made from simple malt?—In the vinegar trade they have generally followed the same line as the brewers. At one time brewers were compelled to make beer from malt only, and then they were allowed to use malt and grain, or malt and sugar; the vinegar brewers have gone in the same line and use grain and sugar.

787. There is another point upon which, perhaps, you can give us information, namely, as to what is contained in vinegar without any prefix. If the article is sold as vinegar, has it been decided what it must be?—I think it depends very much upon what country you are in as to what constitutes, because in Scotland the white vinegar is generally used.

Mr. *Frye.*

788. And in Ireland too?—And in Ireland too. It is generally acetic acid and water. The judgment of the Recorder of Birmingham is that this white vinegar is not vinegar at all.

Sir *Charles Cameron.*

789. Do you not think that a very useful portion of the functions of any chemical court of appeal is to define words in common use in commerce; for instance, it is but fair that the traders in vinegar (the retailers) should know what "vinegar" means?—I think that the great difficulty about that is due to the fact of experts fixing these particular points. There is no doubt that commerce goes a great deal faster than experts do; so that you have to take carefully into consideration that in insisting on definitions you do not fetter trade.

790. That is true; but at present the experts give their evidence before judges who in different localities decide differently; is not that so?—Yes, it is so.

791. And is it your opinion that it would conduce to convenience if the experts advising a Government Department were to issue under order definitions of common articles that might be varied from time to time?—They must be varied from time to time, and very often.

792. Do you think that would work?—It might work, but I doubt it.

793. For instance, if the Inland Revenue were asked to lay down a definition of what constituted "vinegar," whether a solution of acetic acid was comprised within the word "vinegar," they would consult you and other experts and issue that order. Does any objection present itself to you to such a proceeding?—May I answer your question in another way?

Sir *Charles Cameron*—continued.

794. Certainly?—A peculiar point about the Inland Revenue vinegar regulations is that any person who makes a vinegar that is fit for human consumption is a vinegar maker, and has to take out a licence; so that these poor unfortunate creatures on the one side are charged with licence duty, and on the other side they are not allowed to sell the product that they make.

795. Are the men who make dilutions of acetic acid charged for licence?—Any person who makes acetic acid that is fit for human consumption is a vinegar maker under the excise laws, and must take out a licence; because so far as the revenue is concerned it is held to be vinegar.

796. But supposing one jar were sent in to you for analysis in the capacity of excise officers you would declare at once that it was vinegar; and if asked to give an analysis with reference to a court you would guard yourself?—We have done it in this way: the reference to us is for a particular purpose, in relation to a particular offence, and we have to see the cause why that is referred to us. For instance, it would be referred to as wood vinegar, and then we should have nothing whatever to do about anything else but to give a correct analysis and say whether we have come to the conclusion that it is wood vinegar. It is the magistrate who has to decide; he administers the law; we do not.

797. Are you aware of any contradictory decisions having been given upon the point?—There was a white vinegar case in Scotland, if I remember rightly, and, as a matter of course, as soon as that came before the court the case was dismissed.

798. Whereas the contrary has been the case in England?—Yes.

799. So that that simple point of what is vinegar has not yet been decided?—No; and there is another case, if I remember rightly, bearing on the definition of "vinegar." I think a stipendiary magistrate in the Midland Counties stated distinctly that he would not recognise any vinegar except that of the British Pharmacopœia, and that is vinegar made from a mixture of malted and unmalted grain by the acetous fermentation.

Mr. *Frye.*

800. Vinegar may be made from sherry, I suppose?—Yes, certainly.

801. Would that be just as wholesome as malt?—Yes. But that definition would entirely exclude the whole of this vinegar made from wine.

Mr. *Channing.*

802. Is that exclusively from malt and grain without the addition of acetic acid?—Yes; it is fermented exactly the same as beer, and the alcohol is converted into acetic acid.

Sir *Charles Cameron.*

803. That would be the proper way of treating vinegar as a drug if it were asked for?—Yes.

804. As a matter of fact, if it were asked for would it be asked for as acetic acid?—No; acetic acid is another substance, and it is remarkable

Sir *Charles Cameron*—continued.

remarkable that when we come to vinegar of cantharides, the second vinegar of the British Pharmacopœia, it is to be made with acetic acid and not with vinegar.

805. I wanted to ask you some questions about standards. You told us about your standard of milk. I think you said that you had adopted 2·70 per cent. of fat?—2·75 is the limit.

806. And of solids 8·50?—8·5.

807. Are your standards made known to, say, the public analysts throughout the country, or if they wish to know your standards do you make any secrets of them?—We do not. The word "standard" is a very awkward word to use.

808. Take limits if you prefer it. For instance, I heard a very distinguished public analyst the other day state that in certain cases when an application was made for your standard (by which I think he meant the same as you mean by limits) it was refused?—I know I have supplied the limits of milk to a number of gentlemen, public analysts, and refused none.

809. Have you supplied the limits of butter?—We cannot do that.

810. Have you not fixed any limit for water, for instance?—We have not.

811. Have you had many cases referred to you?—No; we have had one or two lately, and we have also had a communication from the Irish Government in connection with water in butter.

812. In this report I think one gentleman refers to some Irish butter containing 19 per cent. of water as having decided the standard adopted by Somerset House?—I can at the moment only tax my memory, I cannot be quite certain; but if I remember rightly that 19 per cent. of water was really in a sample of butter made in a private house years ago.

813. And you have not adopted any water standard at all?—No; but we have stated distinctly to the Irish authorities that we think that when the butter comes over 16 per cent. the water ought to be limited to that or close upon 16 per cent. in tub butter.

Mr. *Kearley.*

814. Dr. Bell, I think, expressed the opinion many years ago that anything in excess of 16 per cent. of water should not be considered a pure butter?—Yes, some years ago.

815. It is recorded in his little book, I think?—I will not be sure of that, but I know that the statement has been made.

Sir *Charles Cameron.*

816. That is a matter of opinion; but do you agree to the principle of fixing a standard of water in butter?—It is very difficult to say that I agree, because, of course, when you come to three or four different kinds of butter, take Irish fresh butter, for instance, the limit there never exceeds something like 14 per cent., and some of it is down to 11½. If you made a limit or standard of 16 or 17 per cent. there would be an inducement to put more water into it than there ought to be in such butter.

817. But does not the same principle hold good with regard to milk; you have fixed your limit of 8½ and 2·75, and you have made

Sir *Charles Cameron*—continued.

that standard known, I think?—I think there is a slight difference between butter and milk, because milk is a thing which has to be quickly consumed, and butter is a thing that lies on hand very often for some time and can more easily be sampled.

818. I ask you more as a practical point, because the Glasgow Dairyman Association wrote to me some time ago asking me, in connection with the Bill which I then had before the House, whether it would not be possible to fix a standard of 3 per cent. of fatty matter in milk, because he said that the Somerset House standard was so much lower than what a good dairyman should send in, that they thought it would be for the advantage of the public if a higher standard were granted, and if the farmers supplying milk under that standard were obliged to decrease that; that was so?—It could be done, no doubt, but I think it would be a very great hardship and grievance with many.

819. What I mean is that your standard is known?—The limit of 8·5 and 2·75 is known.

820. And if there is any temptation to watering down to that either in milk or butter they have, at all events in the milk case, your standard?—Yes, they have.

821. They have not in the butter case; you have not fixed any standard?—We have not.

822. Cases have been submitted to you, I suppose, of disputed results in butter?—Of water?

823. Yes?—I think we have had several cases about the limit of moisture in butter.

824. You do not remember what the percentage was?—What we had to do with was the excessive quantity of water, and of course we had nothing to do but to say what quantity of water there was in the samples submitted.

825. But you had not to pronounce whether it was pure butter or not?—No.

Mr. *Kearley.*

826. How did you make your standard known; I understood you to say that it was known in milk?—If any gentleman writes for our limit we send him word.

827. You do not communicate it authoritatively to the public analysts?—We do not consider that we have authority to do anything of the kind, because they are an independent body altogether, and they might think it was dictation. We do not withhold it, but we do not communicate it.

Mr. *Channing.*

828. But it becomes generally known through these test cases, does it not?—Yes.

Sir *Charles Cameron.*

829. In connection with that subject I should like to know your opinion as to the desirability of extending the system of standards on even recognised limits. You have a legally enacted limit in the case of spirits, have you not?—Yes.

830. Will you please state to the Committee what it is?—In the Act of 1879 it is 25 per cent. in the case of brandy and rum and whisky, and 35 per cent. in the case of gin. But unfor-

Sir *Charles Cameron*—continued.

tunately, I think, we have got a greater percentage of adulteration in spirits than in any other thing that we have.

831. Do they put in more water?—They seem to get as close down to the standard as they can. They frequently overstep the line. Of whiskies, gins, rums and brandies we have examined 33 samples, and the percentage of disagreement 45·4.

832. What do you call the percentage of disagreement?—What has been done is this: the spirit has been brought down to 25 and 35, and then the extractive matter, or what is called the obscuration, in many cases has not been taken into account, and when it is taken into account the strength is just above the line. That is where many of the disagreements have arisen.

833. Do you say that spirit samples which have come under your observation for excise or other purposes are diluted down below the limits?—For excise purposes we do not take the point of dilution, because the spirits are kept in warehouses, and we are careful that no one gets access to the spirits until they are taken out for consumption. These dilution cases come before us in cases of reference under the Sale of Food and Drugs Act.

834. And only in those cases?—Yes.

835. You do not appear to have had a very large number of cases?—No.

836. There is another article in which you have a standard fixed, that is butter. The standard fixed is absolute purity, free from anything?—Yes.

Mr. *Frye.*

837. Supposing you are selling a bottle of whisky, you can sell it adulterated to any extent provided that it is so stated on the label?—Yes.

Sir *Charles Cameron.*

838. You have a standard in butter. The standard of butter is that so far as regards the admixture of margarine or anything of that kind, it is perfectly pure?—Yes.

839. You have not got, as you have told us, a water standard?—We have not.

840. But you have got a known standard and a published standard with respect to milk, and this standard with regard to spirits?—Yes.

841. Do you think that that system might not be extended?—I think that if it were to be extended to butter the probability is that you would have a very much larger amount of adulteration than you have at the present time.

842. But you have got a standard of butter?—I am talking now of foreign fat, not of water in butter, because the butter itself varies so much in composition that if you were to try to fix any particular standard figure, it would give such a margin for the introduction of foreign fat that there would be great difficulty in working upon it in actual practice.

843. I did not suggest that, but you have a standard of absolute purity fixed in the case of butter?—Yes.

844. And you have a standard of dilution fixed in the case of spirits?—Yes.

Sir *Charles Cameron*—continued.

845. And you have a standard, the result of your researches, fixed in the case of milk?—Yes, a limit.

846. And I think you have a standard of moisture in the case of tobacco?—It must be under 35 per cent.

847. Do you think that that system of publication of official limits might not assist in bringing about something like uniformity in the administration of the law?—It might bring us uniformity in the way of analysis. Whether it would give satisfaction to producers is another thing. I do not think it would in many cases.

848. I do not speak of it with regard to its giving satisfaction to producers, but with regard to adulteration cases. Take, for instance this case. The analysts of Manchester or Birmingham, knowing your standard, will not recommend proceedings in a milk case which comes up to your figure?—No.

849. In a spirit case he will not recommend it; he will not attempt proceedings where the amount of dilution is not more than that prescribed by law?—No.

850. What I wish is the opinion of yourself, as a member of a very important department, as to the possibility of extending this system of known standards so that the analysts in different parts of the country might work on something like the same lines?—As far as the analysts are concerned there is no doubt that the establishment of standards obtained by defined methods of analysis would certainly bring in unity, whereas sometimes there is discord at the present time; there is no doubt about that.

851. And they do make standards for themselves, and then you make other standards for your department, and that sometimes brings you into conflict?—Yes.

852. Is it your opinion that whereas the standards of your department, or of a central department, would be official, such a standard set up by a central official department would be more convenient and more just on the whole than a standard which may vary with the taste of each individual?—There is no doubt that it would be easier to do, but I am not so satisfied about the justice of the plan.

853. It is proposed, as you are aware, that there should be some central department?—I have seen the statement in the draft Bill of the public analysts.

854. Assuming that such a central department were set up, do you think that there would be any difficulty in, at all events, very largely extending the list of articles in which a recognised standard might be published?—I think there would be considerable difficulty. There is no doubt that, so far as the establishment of standards is concerned, if the standard were recognised it would be a great deal easier to work the Adulteration Act so far as the analysts are concerned; but it is quite another question for the producers; they would have something to say to that too.

855. But do you not think it is desirable to apply the same principles, so far as possible, to all classes or articles?—Evidently, as far as you can, as long as they do not conflict with other interests.

856. Then

Sir *Charles Cameron*—continued.

856. Then what I ask you is, whether you have considered that the same principles as are applied to spirits and to milk and butter (that is to say, the fixed definitions of standard) could not be extended to a number of other products?—Certainly they could.

857. You have come to a standard of the composition of milk; as an honourable Member did not exactly catch what you said, would you please give the official limit including the water, the Somerset House limit?—Itwould stand thus: in 100 parts of milk there would be 8·5 per cent. of solids not fat, 2·75 per cent. of fat, and 88·75 of water.

858. I want to ask you a question now as to whether you have had any references to you under the first couple of sections of the Act of 1875 in regard to articles mixed with ingredients that are said to be injurious to health?—No. We have had no references as to any question of that kind.

859. Neither in food nor in drugs?—No.

860. Have you had any references as to drugs?—Only a few, one of laudanum. We have also had a reference in what is scarcely to be called a drug, and yet you cannot call it anything else, namely, sweet nitre; we have had four references of sweet nitre.

861. How does that crop up so often?—Because the ordinary sweet nitre of commerce is different from the spirit of nitrous ether that is mentioned in the "British Pharmacopœia."

862. Do you know what view the magistrates took upon that point, whether the sweet nitre of commerce was not a sufficiently well understood term?—The view of the magistrates, I think, turned entirely upon what was asked for.

863. To come to another point in regard to which the Act has been well worked, has it not; that is, coffee?—Yes.

864. I want to ask you a few questions about coffee mixtures. In the first place, is it possible by analysis to determine very accurately the amount of coffee and chicory respectively which are contained in any mixture?—No, it is very difficult indeed.

865. I heard the other day a very distinguished chemist, Mr. Hehner, state that the percentage of soluble matters in chicory appears to have increased during the last 10 or 15 years, and that it had become necessary to make allowance for that increase in modern analyses. Has your attention been called to anything of that kind?—Yes, it has. There is no doubt that there is a greater extractive got from chicory now than there used to be 10 or 15 years ago.

866. Is that agreed among chemists, or is it owing to your improved methods of analysis?—It is on account of the difference of growth, I believe, and not to improved methods of analysis.

Mr. *Frye.*

867. That the quality of chicory has improved?—It contains more extractive matter and is richer in sugar.

Sir *Charles Cameron.*

868. I suppose you are obliged to adopt a different standard of extractive matter as indicating the percentage of chicory?—The difficulties in regard to coffee and chicory mixtures arise in this way: that in different descriptions of coffee the extractive matter is greater in one kind than in another, and from examining the mixture you cannot trace back what kind of coffee is present in the sample. You are aware that there is a certain quantity of chicory there, because you can see its distinctive structure under the microscope, but you cannot tell the exact amount of extractive matter that there was in the chicory that has been used on account of the presence of the coffee. Consequently we have two unknown points to deal with in trying to settle the percentage of the mixture, and we cannot, of course, do it accurately.

869. In connection with the analysis of coffee mixtures, have you had many references to Somerset House?—I think not; but by reference I can tell you the number. It is 18 and 8 : 26.

870. In how many have you agreed or disagreed?—In eight cases we have disagreed.

871. Is that more or less than the ordinary percentage of your disagreements?—It is about the same; it is a little higher than the ordinary disagreements.

872. I think you have an analysis there. I cannot give you the exact reference, but perhaps you know the case, in which seven specimens of a mixture of chicory and coffee were prepared; each of them was said to be prepared separately, weighed, and 10 per cent. of chicory added in each case separately. Those specimens were said to have been distributed to six public analysts, and to Somerset House, and the reports differed extraordinarily; one report being that the article was genuine coffee, another that the percentage of chicory was 16 per cent.; and not one of the seven hitting off the exact figure?—That is very likely, but I cannot see how that was referred to Somerset House, unless it was in some way connected with the Sale of Food and Drugs Act.

873. That is what I want to know?—I should like to know further particulars of that.

Mr. *Kearley.*

874. That was the Birkenhead Corporation case, who desired to test it, not the public analysts?—I remember the case now.

Sir *Charles Cameron.*

875. The quotation that I gave was from a paper called the "Analyst"?—It is only just to all the analysts concerned in that case to say that the first point to be taken into account is, whether the mixture was thoroughly made, because that is very important; and when you consider the amount that you take for an analysis, and the quantity that you want for microscopic examination, unless there has been a thorough admixture you will not get the same mixture throughout.

Mr. *Frye.*

876. If it was not properly mixed you might find the bottom part chicory and the top part coffee. This was perhaps a case in which the different results arose in that way, from the ingredients being badly mixed?—I feel certain that the state of the mixture must have had

Mr. *Frye*—continued.

something to do with it, otherwise there would not have been such discrepancies as those.

Sir *Charles Cameron.*

877. I want to know your opinion as to the possibility of making anything like a close analysis of a mixture of coffee and chicory, and a determination of the relative percentages?—I think that that is one of the most difficult problems that we have.

878. Up to what limit of percentage would you say that it was practically possible to do that?—It depends entirely upon the proportions of the mixture. You would find that it would not be the same throughout the whole range. For instance, if a large quantity of chicory was used there would be a great difficulty in coming anywhere near the percentage on account of the large variation in the extractive matter in commercial chicory; but if you had a small percentage of chicory you would come a great deal nearer, of course.

879. The law, I believe, has recently been fixed in relation to the demand for French coffee, to the effect that any admixture can pass under that title?—French coffee as a rule is a coffee that is made from coffee berries which have been roasted with sugar, and containing a large quantity of chicory, and the coffee berries are ground very coarsely, and, as a rule, you find a large quantity of chicory in it.

Mr. *Kearley.*

880. French coffee does not come from France, I take it?—A great deal of it is made in London.

Sir *Charles Cameron.*

881. But it is a recognised and understood description?—It is.

882. Do not you think, for instance, that the recognition by a Department of such understood and tried terms would save a lot of litigation and uncertainty?—The only difficulty would be that there would be another person who would come immediately afterwards and use some other ingredient which was not known to the Act of Parliament, and he would require to have the same licence as a person who was allowed to sell French coffee.

883. But the department would be able to alter and change the standard from time to time, just as you have changed your milk standard?—That could be done, of course, but there would be trouble now and again in connection with it.

884. But what I want to know from you, you being a man who has had a good deal to do with the working of the Sale of Food and Drugs Act, is whether you think that the public convenience could be served by more definite information upon these points, which appear at present only to be capable of being got at after an indefinite amount of litigation?—I must answer in the same way as before: that so far as the chemical part of the work is concerned there is no doubt that there would be a great convenience in establishing a fixed standard, but at the same time other matters have to be taken into consideration with that. For instance, you have to

Sir *Charles Cameron*—continued.

consider how far the Sale of Food and Drugs Act is to go, and what is to constitute "adulteration."

885. On the policy of these points we should not regard you, of course, as an expert witness; but there is a point on which you can give us better information, I think, probably, than anyone else, and that is about the proposal that the Chemical Court of Appeal should be changed from the Inland Revenue Department to some other department, such as the Local Government Board. You are aware that that proposal has been seriously made by the analysts?—Yes.

886. And that they express themselves as very much dissatisfied with the present system, and say that the arrangements for the Chemical Court of Appeal should be entirely remodelled. I am glad to see that you have their proposition before you?—It was given to me the last time that I was here.

887. Would you describe in your own words from the statement what has taken place?—In the first place we have not got an Inland Revenue Chemical Department at the present time, because there has been a committee of inquiry into the different chemical work of the Government; and now we are a Government Laboratory made up of the Customs Department and the Inland Revenue Department, and have to take over the whole of the work from the other departments. With regard to the suggested Board of Reference, the suggestion is that "there shall be appointed a board or committee consisting of the chief chemical officer of the Inland Revenue Laboratory, a person nominated by the General Medical Council, three persons, being public analysts, nominated by the Local Government Board, and a person nominated by the Board of Agriculture." If you notice what is to be the composition of this Board of Reference, in all the trades that are concerned, there is not a reference to those trades at all; in fact, when we look at the numbers, you will find that there are to be three public analysts, and there are to be three others who practically will be outvoted by the analysts.

888. So that, in the first place, you object to that proposal of a Board of Reference as an unfair composition?—Yes; it is really a reference in which, so far as the trades are concerned, they have no voice in the matter. The reference seems to me all wrong.

889. Have you anything to say on the proposal for transferring the department from the position in which it now stands to the Board of Trade or the Local Government Board?—In regard to that I think that the first point which has to be considered is whether the Board of Inland Revenue as referees under the Act have done their duty, or whether they have not. If you look at the work which has been done, and the decisions that have been arrived at by the magistrates, I think you must confess that they have done their duty.

890. What I should like you to explain to the Committee is the opinion of your department upon the subject. I understand you to say emphatically that there is no necessity for any change?—Not the slightest.

Sir *Charles Cameron*—continued.

891. And you would deprecate being put under any other department than that under which you serve at the present time?—I feel in this way respecting your proposal. Of course the Government of the day is the authority that I have to obey, and if the Government of the day were to say that certain things had to be done, I, as a loyal civil servant, should try to carry out their instructions to the utmost of my ability.

892. Then you consider it a question of policy, and not a question upon which you, from your official position, can express an opinion?—I think I can express at opinion.

893. And that opinion would be hostile to that suggestion altogether?—Certainly.

894. As a matter of fact, I suppose that there would be no particular difficulty in a transfer of the department from the position in which it now stands to another department?—We do the whole of the Board of Trade work now at the present time, and have done it for years.

895. But as regards the Local Government Board Department, you are not in very close communication with them, apparently; you do not report to them at all, do you?—Whenever any question arises on which we have to report to the Local Government Board Department we do report to them; but nothing beyond that.

896. I mean in connection with the administration of the Sale of Food and Drugs Act?—If there is any question that is necessary to be referred between the two Departments it is referred; but as a rule it is not necessary.

897. Take the case of beer adulteration. I think that Mr. Thomas, who represented the Local Government Board Department before us the other day, spoke of beer as being little adulterated, and being chiefly adulterated with salt; he evidently spoke of cases referred to them by the public analysts?—Yes.

898. You, on the other hand, have done an enormous amount of beer analyses, but you would not report those analyses to him, or to the Local Government Board Department at all?—Those are distinctly Revenue cases; they have nothing to do with the Sale of Food and Drugs Act at all.

899. Do you not think that in that matter it would be an important item of knowledge on the part of anyone having to administer the Sale of Food and Drugs Act, if he knew that you had made this enormous number of examinations of beer, and the results that you spoke of?—In that same Report to which I have referred, in which the results of the work done for the Local Government Board are given, there is a return of the number of samples of beer which are examined for adulteration; that return comes in the same Report.

900. Do you say that if the defendant chooses to get it, it has the information accessible?—Yes.

901. In regard to margarine you made some reference to someone who had asserted that some of the fats used in the manufacture of margarine came from the knackers. That could not be the case now, could it, under the present Act?—I do not think so now.

Sir *Charles Cameron*—continued.

902. Every place where margarine is manufactured in this country has to be licensed, has it not?—Yes.

903. And is under inspection?—Yes, so far as the licence is concerned.

Mr. *Frye.*

904. Where does this fat, then, come from; can you say?—I repeated the evidence of Dr. Voelcker before the Commission in 1874; he made that statement in his evidence before the Commission then.

905. You have never heard of such a thing lately?—No.

Mr. *Whiteley.*

906. Is there any standard of purity for margarine?—No.

907. As a matter of fact, margarine, as you have to deal with it under the Sale of Food and Drugs Act, means any imitation of butter, does it not, that is not butter; any impure imitation of butter?—Any foreign fat that contains butter is margarine under the Act.

908. But butter that contains foreign fat is margarine also under the Act?—Yes, it is.

Mr. *Yerburgh.*

909. I should like to know whether the manufacturers of margarine are liable to inspection in this country?—Section 9 of the Margarine Act, 1887, provides that "Every manufactory of margarine within the United Kingdom of Great Britain and Ireland shall be registered by the owner or occupier thereof with the local authority from time to time in such manner as the Local Government Boards of England and Ireland and the Secretary for Scotland, respectively, may direct, and every such owner or occupier carrying on such manufacture in a manufactory not duly registered shall be guilty of an offence under this Act."

Colonel *Bagot.*

910. Have you any statistics showing how many manufacturers of margarine there are in the country?—No, I have not; they do not get the licenses from our department.

Mr. *Channing.*

911. Even supposing that that clause of the Act gives us the power of checking the use of foreign fats for these purposes in England, we have no such similar power, have we, with regard to the margarine which is imported from abroad?—We have not.

912. None whatever?—No.

913. I do not know whether you are competent to say, but is it your impression that there has been a very considerable increase in the importation of margarine in various forms?—I have got a return here for the last year. The quantity of butter imported for the year 1891 was 2,135,607 cwts.; in 1892, 2,183,009 cwts.; in 1893, 2,327,473 cwts.; and now for margarine, in 1891, 1,235,430 cwts.; in 1892, 1,305,350 cwts.; and in 1893, 1,300,033 cwts.; so that in 1893

Mr. *Channing*—continued.

over 1891 there has been an increase of about 75,000 cwts.

914. Is it your impression that a large proportion of the butter imported from abroad is to all intents and purposes margarine?—There is no doubt that there is a considerable quantity of butter imported from abroad which contains a certain percentage of foreign fat, and therefore it should be called margarine under the Act.

Mr. *Kearley.*

915. These figures, of course, which you have given us of the butter imports take no cognisance of that adulteration?—No, the imports come under the head of butter.

916. So that the importation of margarine may be much larger really?—Yes.

Mr. *Channing.*

917. Have you any official experience of the inspection and testing of these foreign imported butters?—We have done this work for our own information for the purpose of seeing what they do contain. We have had some admixtures, without any doubt, which have been imported as butter containing a large quantity of foreign fat.

918. Has that been put in evidence before?—It has not.

919. Can you state the results of those experiments?—If you would allow me, I would rather speak of these cases when I come again. I will get the facts that I can speak of with confidence.

920. Then will you have it next Wednesday?—Yes.

Sir *Charles Cameron.*

921. Is it the duty of your Department to do whatever chemical work in connection with imported margarine occurs in the Customs Department?—The Customs Laboratory is a part of our department now, and the work is done there.

Mr. *Channing.*

922. They do not have their own analyst and refer to you on appeal, but they refer direct to your question of analysis?—They have their own analyst down at the Custom House.

923. But he is under your supervision?—He will be now an official of the consolidated Laboratory, but he was not before.

924. And he will conduct his operations on the same lines and the same standards as yourselves?—Yes, no doubt he will.

925. Can you state now whether you think that there is any sufficient check in the present system as to the introduction of margarine from abroad in the form of butter?—No; and there is a great difficulty in the way of having a check on importations of butter or margarine, because, as butter is a perishable article, anything that has to be done with it must be done very quickly in taking samples, and very few people would like to take the responsibility of seizing a portion that might afterwards turn out to be all right.

926. Has that responsibility been exercised?—I cannot say for certain whether it has.

927. How are samples taken of the foreign imported butters; perhaps you will explain that to the Committee?—I cannot tell how the Customs Department take the samples.

Mr. *Channing*—continued.

928. But in a certain consignment of butter is it the Custom House arrangement to take one or more samples of that particular consignment?—I do not know how many samples they take, and I do not know the regulations at the present time in connection with the sampling of butter under the Customs Board. I think samples are taken chiefly under the Trades Marks Act.

929. You cannot give us an opinion on that point?—No, I cannot at the present time.

930. With regard to one question that was asked you by Sir Charles Cameron about the determination of the precise proportions of articles like chicory and coffee when mixed, the test that you apply to an article like coffee would always enable you to say whether it was adulterated with foreign substances, would it not?—Yes.

931. But you think that the precise proportion would be a difficulty?—Yes, that is where the difficulty would be.

932. Would not the use of conventional terms such as "French coffee" be a fresh license to misrepresentation to a certain extent?—I think it would.

933. Supposing that to have been licensed by the highest Court of Appeal, as Sir Charles Cameron says, do you think that it would be desirable in the public interest to check misrepresentation and false representation of articles of food?—I think that it is not desirable to extend such regulations.

934. I want to ask you a few questions as to the test that you apply (I do not think you have given any evidence on that point) to determine the presence of margarine in alleged butter. Perhaps as you have given the tests with regard to milk it would be of value to the Committee if you could give briefly in clear popular terms what tests you consider satisfactory with reference to determining the presence of foreign fats and the proportion of foreign fats in any sample of butter?—Perhaps it would be better to start with the general principle first. In the analysis of a butter we have a certain percentage within certain limits of insoluble fatty acids, and a certain proportion within certain limits of soluble fatty acids. In a foreign fat nearly the whole of the acids consist of insoluble fatty acids. It follows that if a foreign fat be added to butter it will increase the percentage of insoluble fatty acids and diminish the quantity of soluble fatty acids. In the analysis of the sample we determine the quantity or the proportion of insoluble fatty acids, and also the proportion of soluble fatty acids. When we have these percentages we have to go back to the variations in genuine butters, of the insoluble and soluble fatty acids; then, from the physical conditions of the sample, and from the results of the analysis, we have to determine whether the sample that we examine is a genuine butter or whether it contains a foreign fat.

Mr. *Whiteley.*

935. Can you tell that with absolute accuracy?—We cannot, I am sorry to say, because pure butter varies largely in composition itself.

936. I suppose

Mr. *Frye.*

936. I suppose that the fat in the milk and the fat in the cow or bullock would be the same?—To a certain extent, not entirely; you get a slightly different composition in butter from what you get in the fat of the bullock.

Mr. *Whiteley.*

937. I think in your previous answers you said that margarine fat exists in milk?—Certainly.

Mr. *Channing.*

938. The chemical fatty acids exist, do they not, in all these dairy products?—Yes; but when you come to ordinary margarine, and an ordinary butter, there is something else besides that; the fats of margarine do exist in the butter, plus the soluble parts that do not exist in the margarine.

Mr. *Herbert Gardner.*

939. Do the insoluble fatty acids exist in the milk?—Yes.

940. Identical with that which exists in the margarine?—Exactly, plus other fats.

941. Plus other substances?—Yes, plus other fats which give butter its distinctive character.

Mr. *Channing.*

942. So far as you have gone now, I suppose that it would give you a test for the presence of foreign fats?—Within certain limits. This is the difficulty about the examination of butter, that you require to have all kinds of butter, fresh and salt, and you require to have the butter under all conditions of keeping; and therefore we have great variations in the composition of butter according to its origin and keeping.

943. You require to have regard to the physical conditions?—Yes; and then the margin which has to be allowed you is so wide that the adulterators could take an ordinary butter of good quality and add to that a quantity of foreign fat, and in chemical composition this mixture will correspond with genuine *bonâ fide* butter.

944. But how do you determine the proportion of foreign fats present?—We can only do that when we get beyond certain limits.

Mr. *Frye.*

945. What are those limits?—I will give you a case in point. If you take a fresh butter, the probability is that it will yield insoluble fatty acids about 87 or 88 per cent.; in the case of a fat, you will get of insoluble fatty acids something like 96 per cent.; and when you go on the basis of calculation of, we will say, 87 to 96, 9 per cent. represents all the difference that there is between the genuine butter on the one side and margarine (where the butter is absent) on the other side. Now, in the case of butter that has been kept, you may have your insoluble fatty acids go up as high as 89 per cent.; it follows, then, as a matter of course, if you take your first 87 per cent., that you have got an increase of 2 per cent. of insoluble fatty acids in the butter, and that may be either due to the change of decomposition in the butter itself, or it may be due to the addition of foreign fat; but the 2 divided by 9 shows a 22 per cent. margin for adulteration.

Mr. *Frye*—continued.

Mr. *Channing.*

946. Allowing for those limits that you have to apply, can you estimate the result in figures of the proportion of foreign fats present in any sample?—Only beyond the limits. It follows that for a standard or limit you must start at a point that gives a large margin for adulteration.

947. I am speaking, not as a chemist, but merely as having considered the question in manuals. Is there not a test by placing butter and margarine at an equal temperature in certain portions of alcohol which will enable you to test it?—We have tried the experiment and we find that it does not answer; it does not show mixtures as sharply as other tests.

948. That test is used in America, as I dare say you are aware?—Yes, but it is quite fallacious.

949. You do not consider it satisfactory?—I am certain it is not.

950. Are you satisfied with the other test that is called by the name of saponification?—That is the test I have been describing.

951. And which you adopt?—Yes.

952. Does not that work out in figures?—Yes, but only within the limits I tell you, because the butter itself may be so different in constitution, owing to its physical condition, that it gives so large a margin for the addition of foreign fat.

953. Does the condition make a very considerable difference in the amount of potassium hydroxide which is absorbed?—Yes, it does, because that has all to be worked out into percentages again.

954. I see that 227 millegrammes is used in America as about the standard of pure butter?—That may be taken as the standard of pure butter, but at the same time they have to take into account the alterations in the physical condition of the butter, and therefore they cannot make a sharp line as you can in the case of chicory and coffee where chicory has been added to coffee, because with chicory you can detect 1 per cent. The physical structure of chicory is different, and the same remark does not apply to a mixture like butter and margarine.

955. You throw serious doubt on the wisdom of American analysts and other analysts, like Helmer, who have employed these tests, in selecting as the figure 227 millegrammes of potassium hydroxide. What is the test that you would apply?—I should like to look into the whole question if you will allow me, because I do not quite follow your question. If you will ask me the question on Wednesday next I shall be happy to answer it.

956. But we take it from you that within the limits suggested by the physical conditions of the butter, which I suppose are conditions which a man of skill and experience and intelligence would be able to estimate fairly, a capable analyst would be able to approximately state the amount of foreign fat present?—Yes, but he would understate it as a rule, on account of the allowances he has to make for variations in natural butter.

957. There is one question that I want to ask you with regard to these tests which I think you will be able to answer at once; that is, that those

Mr. *Channing*—continued.

oils, to which Mr. Herbert Gardner drew your attention in his examination, will require a higher percentage of potassium than pure butter, will they not?—Yes, such as cocoa nut and palm oil.

958. And that is one of the chief advantages that the adulterators have in using them, namely, that it enables them to avoid detection?—Exactly so.

959. What is arachin; what substance is it taken from?—I do not know its origin.

960. With regard to the working of the Margarine Act, I do not know whether you are prepared to give us any evidence as to the colouring question, or whether you do not consider that it comes under your jurisdiction?—I think that there should be a right to colour margarine in the same way as the colouring of butter is allowed.

Mr. *Frye.*

961. They are both coloured, are they not?—Yes.

Mr. *Herbert Gardner.*

962. What is butter coloured with?—Anatto, usually.

Mr. *Channing.*

963. One main object of these Acts is to prevent misrepresentation, is it not?—Yes.

964. In your opinion, would it not be a greater advantage to the purchaser if colouring matter were prohibited in the case of these foreign adulterated fats; I mean to say margarines of all kinds?—Any regulation of that kind must increase the price of butter, and so we have to take into consideration the feeling or wish of the purchaser as well as the fact of the particular colourisation or non-colourisation for the purpose of identifying some particular article.

965. Is there any advantage to the consumer in colouring margarine?—There is the same advantage as there is in the colouring of butter, I suppose; he likes it, because it is more attractive.

966. But it enables him to be defrauded of a certain amount of value of the article more easily, does it not?—I should not like to say that. But there is no doubt that we like anything that we eat to be attractive to the eye.

967. Is it a fact that a large majority of samples of butter found to be adulterated are blends of butter and margarine, and not margarine pure and simple?—They are blends of butter and margarine.

Mr. *Frye.*

968. Mixtures, as they are called?—Yes, mixtures.

Mr. *Channing.*

969. Have you any opinion as to the extent that margarine may be mixed with butter and remain undetected by your test; what percentage, would you say, could be added without detection?—From 7 to 15 or 16 per cent.

Mr. *Kearley.*

970. It would vary according to the quality of the margarine, would it not?—Yes, and butter, and that is the reason why I answered it so.

Mr. *Frye.*

970.* That shows that margarine is really butter, does it not, to all intents and purposes?——

Mr. *Channing.*

971. You have stated the number of cows in milk, and I suppose you have stated also the amount of imported butter; I do not know whether you stated also the amount of home butter brought into the market, but is your impression that the number of samples taken at present is anything like enough to check fraud and misrepresentation of butter by the use of butter substitutes?—I think that the number of samples taken either of butter or milk is not sufficient for the purpose of detecting adulteration.

972. Is not one difficulty in the taking of samples that those officially employed to take samples are perfectly well known to most of the fraudulent dealers?—But they do not take the samples themselves; a judicious sampler uses all kinds of people for the purpose of taking samples; he is not far away, but he uses different people for the purpose of making his purchases.

973. Private persons may do so, but does the inspector do so?—The inspector does so.

974. Is the official entitled to use any deputy? Yes. I have known cases where women have been sent in to purchase samples, because adulterated samples would not be sold to the inspector.

Mr. *Frye.*

975. That is commonly the case, is it not?—Yes.

Mr. *Kearley.*

976. It is the usual method?—Yes.

977. The inspector rarely comes himself until he comes to announce himself after the sample has been bought?—Yes.

Mr. *Channing.*

978. As to the milk standard; you were unable to state the standard adopted in Paris, but you were aware of the standard adopted in New York. Are you aware that the standard adopted in another of the American States, the State of Massachusetts, is still higher than that of New York?—I believe it is, but I should also like to ask whether it is in full use in that particular State.

979. The presumption, so far as we have any evidence, then, is that higher standards are required both in the United States and abroad than are in demand here?—It appears so.

980. Therefore the law is, if anything, more favourable to the dealer who may be brought under the Adulteration Acts here than it is abroad?—Yes, from the evidence at present before us.

Friday, 13*th July* 1894.

MEMBERS PRESENT:

Colonel Bagot.
Mr. Bolitho.
Sir Charles Cameron.
Mr. Channing.
Mr. Colman.
Sir Walter Foster.
Mr. Frederick Frye.
Mr. Jeffreys.
Mr. Kearley.
Mr. Kennedy.
Mr. Kilbride.
Mr. Lambert.
Sir Mark Stewart.
Colonel Warde.
Mr. Yerburgh.

SIR WALTER FOSTER IN THE CHAIR.

Lieut.-Colonel JOHN FREDERICK CURTIS HAYWARD; Examined.

Chairman.

981. I BELIEVE you are connected with an association which was formed in 1892, called the Dairy Produce Defence Association?—Yes.

982. Have you held any official position in connection with that association?—I held a nominal position as treasurer.

983. But you are acquainted with the proceedings of the association?—Yes; I am acquainted with the proceedings, and have attended all the meetings. I was one of the chief promoters, in fact, on the committee.

984. What were the objects of your association?—The object of the association was to see the extent to which adulteration existed, particularly in butter and milk, in Gloucestershire, and more especially in the towns of Gloucester and Cheltenham. Gloucester, I may say, is a town where the Adulteration Acts have been always in abeyance; and in the county of which Cheltenham formed part, before the County Council undertook the work, the court of quarter sessions carried out the Adulteration Acts through the chief constable and the police. But I and others were struck with the small number of articles which were found to be adulterated, and we thought that it did not give the true state of the amount of adulteration which took place; therefore we wished to form this committee to see first of all to what extent adulteration in butter existed.

985. And in milk?—And in milk; but we did not get to milk; we only dealt with butter, and we selected Gloucester, as our headquarters were in Gloucester, as the first field of our operations.

986. Did you find reason in the course of your inquiries to suppose that adulteration of butter extensively prevailed?—We did.

987. What steps did you take in the first instance?—We purchased samples of butter from 94 shops in the city of Gloucester, but I find that we did not submit all of them for analysis; we submitted, I believe, about 64 of them for analysis.

Chairman—continued.

988. That is to say, that about two-thirds of the number of samples were submitted for analysis, roughly speaking?—Yes.

989. What was the result of that analysis?—The public analyst reported that 15, I believe it was, of the samples were very largely adulterated.

990. With what?—With foreign fats.

991. Was the extent of the adulteration considerable?—None of those cases had less than 20 per cent., and some I believe 50 per cent. of foreign fats.

992. After making that discovery, did you take any second step?—We then went to the Corporation, or rather to the town clerk, and to the officer who is deputed by the Corporation to carry out the Adulteration Acts, or rather in whose hands the Adulteration Acts are placed, though, as I have said before, they have not been carried out, and asked them to take steps to enforce the Acts.

993. Did the Corporation acquiesce in your suggestions?—The officer at once said that he would take samples, and he proceeded to do so, but he was not so successful as we had been, from what cause I do not exactly know, but he only got evidence in four cases, which was considered sufficient for a prosecution, and there was a conviction in each of those four cases.

Mr. *Channing.*

994. Out of how many samples that he took did he get those four cases?—I believe he tried all the 15; that I will not be certain about, but he intended to take samples from the whole of the 15, and he only got four.

Chairman.

995. All you know is that the four cases were prosecuted?—Yes.

996. And

Chairman—continued.

996. And convicted?—Yes.

997. Do you know any details of the convictions?—They were fined in three cases 5*l.* each, and the other case, I fancy, was an old offender, who was fined 15*l.* and costs.

998. Do you know what was the amount of adulteration in those cases?—No, I do not. I think the public analyst will be able to give you that information.

Mr. *Yerburgh.*

999. Were those the 15 cases in which your association discovered that there was adulteration?—Yes.

1000. I understand that the officer went to those particular shops?—Yes, he was to take samples from those particular shops of which we gave him the names.

Mr. *Kearley.*

1001. Do those 15 samples represent 15 different vendors?—Yes.

Chairman.

1002. As regards Cheltenham, was anything done there?—At that time I brought the subject of adulteration to the notice of the County Council, and pointed out to them that though we were taking steps to enforce the Adulteration Act by the police, we did not get at the offenders; they only, in fact, caught those who were not very clever at it; and I got a committee appointed by the County Council to inquire into the matter. The chief constable was a member of that committee, and he told me that it was only in Gloucester, where the Acts were not carried out, that there was adulteration; that in Cheltenham he had made most careful inquiries, and had taken samples, and he was quite certain that adulteration did not exist there. We were going to have a committee meeting in about two or three days, and I felt that my case would utterly break down if that was not contradicted; I therefore went at once to the same person who had undertaken to get those samples in Gloucester, and told him at once to go and take samples in Cheltenham; he did so, and submitted them to the analyst. I cannot give you the exact number, I think it was 11; but there were a considerable number of them found to be adulterated.

1003. Were those purchases made in Cheltenham on behalf of your association?—Yes.

1004. Did you find that it was well to employ men or women to make purchases?—We employed women.

1005. Why?—Because it is no use a man buying butter; the vendors are suspicious at once if you send a man to buy butter. In the same way, if you were to send a woman to go, perhaps to buy whisky, there would be a suspicion. You must send a proper agent; it is no use sending a man to buy butter.

1006. In fact, you believe that the suspicions of fraudulent traders were lulled when a woman appeared, rather than when a man appeared?—Yes.

1007. They were excited by the appearance of a man buying an article of that kind?—Yes.

Chairman—continued.

1008. And your method probably gained you better results than if male officials had been employed to obtain samples?—Certainly; it is no use, for instance, to send the police. The police say that they go in plain clothes, but a policeman in plain clothes is unmistakable.

1009. State the ground on which you account for the different results obtained by the Corporation of Gloucester from those which you obtained in the first instance?—Yes; that the samples were not taken skilfully.

1010. Of course it might be that the people were warned by your previous inquiry?—I do not think they would be warned by our inquiry; but directly that an officer deputed to take samples for analysis comes in, after the very first case that he takes, the news goes all over the town, and it is no use his taking any more samples.

1011. Do not you think that the news of the formation of your association went over the city of Gloucester?—No, I do not think so; I think it was kept very quiet.

1012. It seems that your association did not live very long?—No.

1013. It seems to have died almost over its first effort?—It died after we had made our first effort.

1014. And it has been in a state of suspended animation ever since?—Yes.

1015. So that you really have no evidence to give us as to how the thing has been going on with regard to Gloucestershire or Cheltenham since that time?—No.

1016. Do you know whether any samples of butter have been since taken in Gloucester?—I believe that none have been taken since that time.

1017. The Corporation have not gone on with the work?—Not at all.

1018. Why did you get into this state of suspended animation?—We found that it cost a good deal of money. It wanted some one or other who could give nearly his whole time to it, and the gentleman who was an honorary secretary, and who was a very energetic man, found that he could not give any more time to it, and although we had not quite exhausted our funds, we should have to go to the sources from which we got our money before for fresh funds to make any more investigations, or to take up any fresh towns.

1019. Then the fact is that the Dairy Produce Defence Association existed in a state of activity for a very short time, came nearly to the end of its funds, and then ceased operations?—Yes, exactly so.

1020. The whole result of this work being the analysis of, say, 60 samples of butter?—Some 80 samples of butter, and of course the expenses attendant on procuring them.

1021. You contend, however, that during its short existence the association did useful work?—I think it did very useful work.

1022. In what respect?—I think we showed that adulteration exists to a large extent, and that corporations like Gloucester do not carry out the Adulteration Acts unless very strong pressure is put upon them.

1023. Anything

Chairman—continued.

1023. Anything else?—I think also that we showed that even where the Acts are carried out as they are in the county of Gloucester, by the police, the police are hardly the agents to use for that purpose; that it is detective work, and not police work.

1024. You mean that it requires to be conducted with a greater amount of skill and care than is possible in the ordinary duties of the police?—Precisely.

1025. Is it not a remarkable thing that if in the city of Gloucester you were able to expose a considerable amount of adulteration of a staple article of food, the citizens have not required the corporation to take steps to protect them against such funds?—I am afraid that they are very apathetic about it.

1026. That is to say, that the people do not care?—No, I do not think the authorities care at all; they think it would be unpopular.

1027. But the citizens of the city of Gloucester elect their authorities, do they not?—Yes, but then that very process prevents them, from fear of courting momentary unpopularity, from carrying out the Acts; that is the only way in which I can explain it.

1028. Would you not consider that there would be more unpopularity on the part of the purchasers, who are a great number, than on the part of the vendors who are a small number?—I should have thought so, but I am afraid there is not. I do not think they appreciate the way in which they are being defrauded.

1029. Then it is a question for societies like yours to educate the public up to a proper standard, is it not?—I do not know. It seems to me than when we have got Acts of Parliament it is the duty of the authorities to see that they are carried out.

1030. But then the authorities are simply the reflex of the wishes of those who elect them, and if the people who elect them are not sufficiently advanced in their opinions with respect to the evils of adulteration, you cannot expect to have an authority who will enforce the Acts strongly, can you?—But the chief sufferers from that are the people who live in the vicinity, who have no votes in Gloucester; the people living in the vicinity of Gloucester, and who of course make all their purchases in the city of Gloucester, have no votes for the corporation.

1031. You think that that accounts for a considerable amount of apathy?—I think it does.

1032. But then the people in the town suffer, do they not?—They do, but they do not suffer as producers, but as consumers, whereas we outside suffer both as producers and consumers.

1033. You suffer from the unfair competition of the adulterated article?—Exactly so.

Mr. *Channing.*

1034. I believe you are a county councillor for Gloucestershire?—Yes.

1035. And a member of the Council of the Royal Agricultural Society?—I am.

1036. And a member of the Council of the British Dairy Farmers' Association?—Yes.

Mr. *Channing*—continued.

1037. And I suppose you are acquainted and sympathise with the views which have been expressed by the two latter bodies, and also know of any action taken by the County Council?—Yes.

1038. Has any action been taken by the County Council to increase the usefulness of these Acts; has that been brought under their notice?—I brought it under their notice after taking these samples in Gloucester, and before we took them in Cheltenham. The chief constable was authorised to procure outside assistance in taking samples; for instance, he might employ women if he liked; he was authorised to do so by the police committee of the County Council.

1039. Did he do so to any extent; have you particulars of what has been done?—I do not think that much has been done.

1040. Where would these samples be taken; in what parts of the town?—They were taken all over the county.

1041. In the smaller towns and villages?—Yes, and also in Cheltenham; it would include Cheltenham.

1042. You spoke of samples being taken from 94 shops; can you tell me what is the number of shops at which butter or butter substitutes are sold in Gloucester?—No, I cannot tell you, but I should think we took them from very nearly all.

1043. Practically your intention was to take samples from all the shops that were worth counting?—Yes, particularly the smaller shops.

1044. And the result was that in about 18 per cent. you found serious adulteration?—Yes.

1045. Did the analyst in his report or certificate make any remarks as to the character of the adulteration with foreign fats?—No; he said that they were foreign fats and that noneof the samples that he reported as adulterated contained less than 20 per cent., and some of them as much as 50 per cent., or more, of foreign fats.

1046. There is no special report as to the particular way that the adulteration was carried out?—No, I do not think so.

1047. Further than the presence of fat?—No further than the presence of fat.

1048. I understand that since you suspended operations the corporation has taken practically no action at all in the matter?—No.

1049. You have not heard of any cases?—I have heard of no cases, and I believe that I am right in saying that no samples of butter have been taken since that date.

1050. I suppose your contention is that the State having passed the Act in the public interest to check these frauds, it is the duty of the State, or of the local authority rather than of private individuals, in the first instance to use the machinery of the law to check these frauds?—Certainly.

1051. You do not think that the whole cost of the machinery of carrying out these Acts ought to fall on individuals who are specially interested?—No.

Mr. *Channing*—continued.

1052. Although of course you believe that they ought to look after their interests within reasonable limits?—Yes.

1053. You are acquainted, I suppose, with the suggestions which have obtained the assent of the Central Chambers of Agriculture?—Yes, I have them here.

1054. And one of those is the appointment of Government travelling inspectors, is it not?—Yes.

1055. I suppose that one of your objects in giving evidence here to-day is to bring forward a typical instance which shows the necessity of a Government travelling inspector to be sent down to correct the inaction of the local authorities?—Yes; and also to follow the matter up, because it is no use for a man who is adulterating some article to be prosecuted once, and then left alone for ever; you want to be going on worrying him until you make him give up the sale of adulterated articles.

1056. And besides that, is it not the case that the sale of adulterated butters is to a great extent organised, and has ramifications all over the country, which a central inspector would be able to track out, and so bring the law to bear on the same set of operations in different centres in a way that a local inspector could not do?—Yes, there are many men who have shops in three or four different towns.

1057. Are there any shops in Gloucester or in Cheltenham which openly advertise margarine?—Yes, I have seen "Margarine" put up in one or two shops.

1058. Perhaps you will describe what you have seen?—I have seen a green label, "Margarine."

1059. But not a large notice on the front of the shop?—No, I have seen in the shop window a quantity of butter put "guaranteed pure," &c., and then a little piece at the side with a small thing, "Margarine."

1060. I ask you that question because there is a question of that kind in Northampton, where they openly advertise margarine, the whole stock I believe is margarine, and it is exposed under that description; that you would not object to, I take it?—No, I do not object to the sale of margarine in the least if it is sold as such.

1061. What is you opinion about the use of colouring matter in margarine?—I think if it was illegal to colour margarine, it would be a great safeguard against its being sold as butter.

1062. The colouring matter, I suppose, is not unhealthy; you do not contend that it is unhealthy?—Not in the least.

1063. Would you prohibit the colouring of butter also?—If you could prohibit the colouring of foreign butter as well, I would prohibit it; but it would never do to prohibit the colouring of butter in England and allow foreign butter to come in coloured, because the English public will have coloured butter; they like a high colour, and it is no use telling people that they are the same articles, only that one is coloured and the other is not; the people say that they like the yellow milk or butter because it looks so much richer.

Mr. *Channing*—continued.

1064. You think that the prohibition of colouring margarine would have a considerable effect in checking these frauds?—I think it would.

1065. Have you seen the suggestion that has been made by a good many grocers' associations, that the same object could be obtained by selling margarine in blocks of a certain shape and weight?—No.

1066. But you are of opinion that any precaution with regard to colouring or any other form of deception, should be applied with equal force and stringency to foreign imports?—Yes.

Mr. *Jeffreys.*

1067. I gather from what you have said that what you think is most necessary is that some official shall be appointed to go and take these samples, and commence prosecutions against the people who adulterate the samples?—Yes.

1068. And you say that in Gloucester and Cheltenham the municipal authorities do not take that action?—In Gloucester they do not. In Cheltenham they are under the County Council.

1069. But then the County Council seem to be just as bad as the municipality, do they not?—Not quite, I think. I think you will see on receiving the report of the public analyst that in Gloucester, where the Acts have never been carried out, the percentage was larger, and also that when they began to take samples for prosecution, they got fewer convictions than they did in Cheltenham, where they had a smaller number rather of cases found by our association to be adulterated, but out of those a large number were brought to book.

1070. Then in Gloucester I think you said there was a certain unpopularity attaching to enforcing the Acts; is it the case that a large number of the town council are shopkeepers themselves?—Yes, they belong to all classes; there are some shopkeepers and some merchants.

1071. Were they against it because they were shopkeepers, or what was their object?—If you ask them individually, they are all very keen to do it. I have brought it before them individually, and they have all said, "We will see about it at the next council meeting"; but nothing is ever done.

1072. You think that if colouring matter were forbidden to margarine that would be one of the greatest safeguards without adulteration?—Yes.

Colonel *Bagot.*

1073. Can you tell us what is the colour of margarine in its natural state?—It would be white.

1074. Like lard?—Yes.

Mr. *Jeffreys.*

1075. I suppose that you are aware that already in Holland there is an Act of Parliament which prevents the colouring of margarine?—I believe there is.

1076. And

Mr. *Jeffreys*—continued.

1076. And you think that a similar Act might be passed here?—Yes.

Colonel *Bagot.*

1077. Have you ever heard it suggested that margarine should be coloured in some totally different manner, so as not to appear like butter at all?—Yes; but I doubt whether the public would be prepared for such a thing as that; I have never advocated that, because I do not think it is possible. I remember that there was a gentleman who advocated that it should be coloured pink, but if you did that it would be almost tantamount to forbidding the sale of it.

Mr. *Jeffreys.*

1078. In fact your committee did not go so far as to recommend the colouring of it in any particular way; they merely recommended that there should be no colourization at all?—Yes.

1079. Your committee recommended, I understand from an answer that you gave to Mr. Channing, that some officer should be appointed to travel about the country?—The Committee of the Associated Chambers of Agriculture, who met in consultation with the British Dairy Farmers' Joint Committee, have drawn 12 recommendations, and one of them is that there should be travelling inspectors; the first one is that there should be no colouring matter.

Mr. *Colman.*

1080. As regards the samples of butter which you say were adulterated, have you any knowledge whether they were made in your own neighbourhood or whether they were foreign butters?—I cannot tell at all.

1081. Is there much foreign butter sold in Gloucestershire?—A great deal in the city of Gloucester.

1082. Can you give no idea whether they were foreign butters or butter made in your own county?—I could not at all; I should say that a great deal of it was foreign butter.

1083. On the question of the inspectors and the suggestion of having women as inspectors, or women to get the samples rather, I suppose it is not considere at the present moment that the authorities have power to employ women?—No, not for the purposes of prosecution, for taking proceedings.

1084. But surely as a private purchaser any woman can have a sample examined under Clause 12 of the Act. "Any purchaser of an article of food or drug in any place," and so on. They may not be employed as inspectors but as private purchasers they can get samples and have them examined, can they not?—But what would be the use of that; you would know that you had received an adulterated article, but you would not be able to prosecute the person.

1085. That is what I want to get at; your suggestion is that the inspector to prosecute should be a woman, or might be at least?—No, I suggest that your inspector should be able to employ whatever agent he considers most suitable to procure the article that he wants.

Mr. *Colman*—continued.

1086. Then in Clause 13, which refers to medical officers of health and inspectors, and so on, which says, "if he suspects the same," if that were altered into, "if he or she suspects the same," you think that would permit of the appointment of female inspectors?—I would rather have this clause, as recommended in this paper, that officers authorised to take samples under Section 10 of the Margarine Act should be empowered to appoint in writing deputies to take samples in their behalf. If that was done I think it would meet the case, that they would be able to depute their power.

1087. Might it not be a little clearer it it were put "Inspector, male or female"?—This, I take it, would allow the persons to depute their powers to a male or female.

1088. If this remain, that "he" shall do so-and-so, that implies that it is not to be a woman?—The meaning of this suggested alteration, that they should be empowered to appoint in writing deputies to take samples on their behalf, must mean deputies male or female.

1089. I suggest that if you are going to hand that in it should be "male or female." You referred to the question of a first conviction, to be followed up by a second prosecution; do you know whether, as a matter of fact, those second prosecutions have or have not taken place?—They have taken place, I believe, against one shop in Gloucester. I believe that the Danish Commissioners came down to Gloucester, hearing that butter sold at a shop that was trading under the name of a Danish company, was largely adulterated, and I believe he got a conviction against a man there, and that he was one of the persons who was convicted under the report that we sent in to the public analyst; I believe that is the only case where a second conviction has occurred in our neighbourhood.

1090. You imply rather, then, that as a rule there are not second convictions?—Yes.

1091. You told us that margarine is sold in Gloucester, I think; is it sold to any large extent, can you tell us?—I imagine to a very large extent.

1092. Then on the question of colouring margarine, you think that it should not be coloured at all?—I think that it would be a great check to its being sold as butter if it was not coloured.

1093. You said, as I understood, that the people in your district practically would not take butter that is not of a fairly high colour?—There is no doubt that butter that has a colour to it sells better than a white butter, and in the winter, particularly in the very cold weather, when you are obliged to feed the cows on roots, it is almost impossible to get the colour which the public like, you know, without putting some colouring matter in; but it is only necessary perhaps for two months in the year.

1094. But as a matter of fact it is done, I suppose, almost universally?—Yes.

1095. I think we were told by a previous witness that no uncoloured butter is sold in England. Would you go so far as that?—No, I would not.

Mr. *Colman*—continued.

1096. In some districts they do not object to butter, I suppose, of a very pale colour?—No doubt some people would not, but taking it as a rule, if you were to take round in a basket from door to door butter, with some of it uncoloured, and some coloured, you would sell your coloured butter, and would come back with your uncoloured butter, unless you happened to sell it all; but the coloured butter would go first.

1097. Supposing there to be districts where butter is sold which is very little coloured, so as to be almost uncoloured, would not margarine interfere in those districts if it also were uncoloured, from the two being so much alike?—No, I do not think you would ever get it. Butter would never be the same colour as margarine, unless it was coloured. My impression is that there would be a distinct difference in the look of it, even if the butter was uncoloured.

1098. You do not go so far as to suggest any colour for margarine, but simply that it should not be coloured?—If you colour it other than as butter, I think you would create an unjust prejudice against it. We do not wish to prevent the sale of margarine at all; we only wish to prevent it being sold as butter.

Mr. *Kearley.*

1099. You say that you do not wish to prevent the sale of margarine when it is sold as margarine?—No.

1100. But you do not wish it to be sold as butter?—No.

1101. In the whole of these samples that you have had taken, did you find any one of them to be margarine pure and simple?—I think that that would be almost a question for the analyst.

1102. Have you not the figuaes?—No; I have not got the figures.

1103. I thought I understood you to say that the adulteration varied from 20 to 50 per cent.?—Yes. I can only give you the general report of the analyst.

1104. But in a general way, might we take it that the maximum of margarine in those butter samples was 50 per cent.; there might be one single exception of course?—There might be. That I could hardly tell you, except that they were all largely adulterated, some of them over 50 per cent., and none under 20 per cent. We did not take any cognisance of anything under that.

1105. What is the outcome of this investigation on your part. I suggest that is more a question of mixing margarine with butter than of margarine being sold as pure butter?—Yes, I should think it was.

1106. It is a question of adulterating, butter with some matter that is not butter?—Yes, I should think it was.

1107. Now, you are strongly of opinion, I take it, that the non-colourisation of margarine would materially bring about the results which you desire?—I think it would.

1108. But at the same time you do not think that the consumer, the purchaser, would tolerate the non-colourisation of butter?—I think it would be quite possible to educate the public to take butter that is not coloured.

Mr. *Kearley*—continued.

1109. But it would be more than a question of education; it would be an enactment that would have to come into force, supposing it were passed by Parliament?—I do not think that there would be any difficulty at all about a general law that butter should not be coloured, provided as I have said before, that you do not allow foreign butter in that is coloured. If you allow foreign butter in that is coloured, that would give it an unfair advantage against our own butter; but if all butter that comes into this country were all uncoloured there would be no difficulty at all.

1110. But assuming that it were not possible to enforce this law on foreign producers, you would not advocate the non-colourisation of English butter?—No, because you would place it at a distinct disadvantage as regards foreign butter.

1111. Then, so far as those samples go, I think from what you said the evidence led you to suppose that they were mainly foreign butters, so called?—I could not say that.

1112. There is a great quantity of foreign butter sold in Gloucester and Cheltenham, I understand?—Yes, a great deal.

1113. Supposing that a law were passed making it illegal to colour margarine, and supposing that an adulteration to the tune of 25 or 50 per cent. still went on (the admixture of margarine with butter), and that butter remained coloured, where would you be then. If the 75 per cent. of butter were coloured, and the 25 per cent. of admixture were white, the result of the whole bulk would not be white: it would still be coloured?—Then you would have not to allow the admixture of butter with margarine.

1114. That is the point which I want to come to. Do you think that it would be advantageous to make it illegal to mix butter with margarine? Yes; I do.

1115. Are you aware that the margarine manufacturers sell what they call mixtures, which are avowedly a mixture of margarine with butter?—Yes.

1116. But you think that it would be advantageous to make it illegal for butter to be mixed with margarine?—I do.

1117. That would, of course, prevent the admixture taking place by the margarine manufacturer in the first place, and it would make it an illegal offence for the vendor to mix margarine and butter in his own shop?—Yes.

1118. Can you tell me who analysed those samples for you?—Mr. Embrey, the public analyst of Gloucestershire.

1119. Did he make any comments upon the percentage of water contained in those samples. Did he look for any adulterant besides margarine?—I have not his report before me, and I cannot tell you. He is going to give evidence on that question and he will be able to answer you.

1120. At the same time that your association was looking out for adulteration of this description of foreign fat, was it looking out for adulteration by excess of water, say?—Yes, certainly, any adulteration. We took those samples

Mr. *Kearley*—continued.

samples and submitted them to the public analyst, in point of fact to give us a test of what they were, as to whether they were proper samples of butter.

1121. The point that I want to put to you is whether your association, which was formed deliberately to check adulteration, had cognisance of the fact that there could be an adulteration in butter other than by means of foreign fats, for instance, by the addition of an excess percentage of water; were you, as an association, aware of that?—Yes, we were; but I do not think we were on the look out for more than foreign fats.

1122. I assume that to be so, and then in making your sample you want to work in the way which you thought would disarm the suspicion of the vendor?—Yes.

1123. By having the purchase made by women?—Yes.

1124. And children?—I do not think we employed children, though a child might be a suitable agent.

1125. And you did that, I assume, because you were under the impression that Corporations and County Councils habitually employed their own employés, who would be men, to make purchases?—Yes.

1126. That is within your knowledge, is it, that these corporations do employ men chiefly to purchase samples?—Yes; I know that the police employ men generally, constables in plain clothes, very likely; but still a man going into any place to buy butter is an object of suspicion, because it is not a thing that a man buys as a rule.

1127. I think there must be a good many men that do buy butter, that go in a garb not quite of the exciting nature of that of a police constable in plain clothes; an agricultural labourer going in to buy butter would not excite attention?—A policeman even in plain clothes is unmistakable.

1128. You found that Cheltenham was a little purer in regard to the quantity of adulteration than Gloucester?—Yes; we did not go so fully into Cheltenham, but its percentage was not so large.

1129. But you attach a great deal of importance to the skill displayed in taking these samples?—Yes.

1130. Were the gentlemen who were responsible for the starting of this association connected with dairy produce farmers, and so on, and landowners?—Yes, land owners chiefly.

1131. Was it really a protective association, so far as their interests were concerned?—Yes.

1132. I think an honourable Member asked you whether you were able to differentiate as to the sources of origin of these butters, as to whether some of them were country fresh butter or foreign butter, and I understood you to say that it was impossible to tell?—I could not tell; I have no evidence to tell that.

1133. There is one question that I would like to put in order to dismiss, if possible, somewhat of a fallacy that seems to prevail in agricultural districts, that is to say, that this adulteration is the cause of the depression in the prices of butter, that it practically governs the low prices

Mr. *Kearley*—continued.

prevailing in butter. Is that an accepted idea?—I think that is a fact.

1134. Then t is an accepted idea, so far as your association is concered and agricultural associations?—I believe it is.

1135. Have you ever heard of the official quotation for butter being fixed, for instance, in Denmark and Copenhagen every week; have you ever heard that there is an official quotation fixed every Thursday in Copenhagen, which practically governs the selling price of all butters on the English market, other than fresh butter?—Yes, I know that there is a fixed price in Denmark; I did not know that it was fixed by authority.

1136. You have heard, of course you must have seen, in reading the "Times" and so on, that that there are market quotations fixed for the bulk of the butters that are sold in commercial quantities on the produce markets of this country?—Yes.

1137. First of all, taking the case of Danish butter, do you suggest that Danish butter is adulterated?—No, not when it leaves the country.

1138. Do you suggest that it is adulterated when the vendor gets gets it?—Yes.

1139. Then I will take the point of the butter leaving that country. You do not suggest that Danish butter is adulterated when it leaves that country?—No, they inspect it carefully, I believe, there.

1140. Then in the fixing of the market price of Danish butter, those who fix it would not take into their purview the possibility of making the price lower in consequence of the butter being adulterated?—No, I do not suppose they would.

1141. Perhaps you will permit me to tell you that this official price, so far as Danish butter is concerned, is fixed in Copenhagen by a Board selected from merchants and brokers, and so on, officially, every Thursday after the boats have sailed, and after the butter is out at sea that quotation is fixed, and that quotation is telegraphed to the London markets; therefore, I ask you whether you agree with me that when these reputable people meet together to fix this price the question of adulteration does not come into their consideration at all when the price is being fixed?—I daresay not.

1142. Then so far as regards Danish butter, at all events, adulteration can have no effect on its market price?—Yes, it has most certainly, and I will tell you why. I believe, though I cannot bring you chapter and verse, that you will find that butter is often sold in provincial towns in shops at a price that gives no margin over the price in Copenhagen.

1143. What butter?—The Danish butter.

1144. So-called Danish butter?—So-called Danish butter.

1145. It is sold retail, you say, practically at the official quotation?—I do not know that. They would not sell it under that.

1146. Still that does not get away from the fact that the official price of butter is fixed, or rather the price so far as Danish butter is concerned, is fixed by an official Board, and therefore

 that

Mr. *Kearley*—continued.

that the market price of that butter must be fixed according to its market value, or the price that it is expected to fetch in the market?—But then the butter would be sold in this country at a price which paid for the carriage, and which allowed for a certain amount of profit to the retailer who retails that butter, but if you find butter being sold at a price not exceeding the price at which you can buy it wholesale in Copenhagen, that cannot be done by fair means.

1147. But before the retailer gets hold of this Danish butter it has to come to the merchants for distribution; you do not suggest that the merchant sells this butter to the vendor, to the retailer, at a lower price than he is able to buy it at from the exporters in Denmark; or to put it the other way round, do you suggest that the merchant is responsible for the adulteration?—I suggest that the retailers who sell tons (as many of them do) in the towns are able to sell butter below what they purchase it at, because they sell so much margarine in the butter that they get 50 per cent. profit on it; that is why they are able to sell the butter even below what they purchase it at.

1148. You mean that they are able to sell butter and margarine mixed together?—No, to sell butter. The process, I believe, is this. You have butter and you have margarine all round. For instance, there is a label with "Guaranteed pure butter," and there are two or three pats of pure butter, and all the rest is margarine; they are coloured exactly alike, and nobody knows which is which. A man comes in, or somebody suspicious, he asks for butter, and he is given one of those fats which is a piece of pure butter, and he gets an article which is worth more than he gives for it. The women, who are the many, come in afterwards, and they receive these other pieces all round, which are not worth half the sum.

1149. They receive margarine, you suggest?—Margarine or a mixture.

1150. You say that the butter would be ticketed "Pure butter"?—Yes, generally.

1151. But the margarine would be ticketed as margarine?—No; you find it all round this one label. The actual piece of butter on which the label is put is pure butter.

1152. But not the surrounding butter?—The surrounding butter is margarine or mixture.

1153. I will not unduly press you on this point, but that does not get away from the point which I am trying to make, which is this: that the market prices formed by the exporters and by the merchants of butter is not at its normal figure, whatever that may be (it varies according to the time of year); it is not at a lower figure than it has been in years gone by, simply and entirely owing to adulteration. What I want to impress upon you is that the price of the genuine article is officially fixed by important bodies, either by exporters abroad, or by merchants of great respectability and repute in this country, and that if the English producer makes a good article and in sufficient quantity to be deemed commercial, he can command for his product a price consistent with that prevailing in the very

Mr. *Kearley*—continued.

best classes of butter which are being imported into this country either from Ireland or a continental country. Would you not go with me to that extent?—To begin with, I do not allow all the butter that comes in from abroad is pure butter.

1154. I admit that?—Then again, those men in a town, who sell large quantities of this butter, which, I say, I believe they can afford to sell below what they give for it, rule the price.

1155. The price of what?—The price of butter.

1156. Retail or wholesale?—Retail; they rule the prices in that town to a great extent. For instance, in neighbouring shops, if you have three or four shops which sell nothing but so-called butter, and they are selling it at 1*s.* a pound, and you find that you cannot make butter under 1*s.* 1*d.* or 1*s.* 2*d.* a pound, you cannot get that because the local retailers say, "What is the use of our selling butter at 1*s.* 3*d.* when those men over the way are selling butter at 1*s.*?" We may for our English butter get 1*d.* a pound more, but we cannot do more, because people will then go and buy butter from those shops; and in that way they depress the general price.

1157. You mentioned the price of 1*s.* a pound retail for butter; do I understand rightly that the agriculturists in your district are able to sell butter to a retailer at such a price as that, he can afford to retail it at 1*s.*, and get a profit for himself?—There is plenty of butter sold in Gloucester at 1*s.* a pound.

1158. Country butter; made in the locality?—Yes; if you sell to the retailers, in Gloucester, or any other town during the summer months, you will get such a price that the retailer can make his profit on it at about 1*s.* a pound.

1159. Then 1*s.* a pound retail in the summer months would not necessarily indicate an adulterated butter; it would be quite consistent with the butter being pure that it could be retailed by respectable vendors at 1*s.* a pound?—Yes, because those other people are selling the butter at that price too.

1160. I do not think the two things follow; I cannot quite see that that is necessarily so. But, as a matter of fact, you do sell, or rather the people that produce butter locally, can sell it to leave a profit at 1*s.* a pound in the summer to the retailers?—No, certainly not. You cannot make butter at a profit to sell at 1*s.* a pound retail.

1161. I must ask you then, are you aware that the official price for Danish butter, which you do not impute to be adulterated, rules as low as from 80*s.* to 90*s.* a cwt. during the summer months, and consequently it would, would it not, leave a margin at 1*s.* a pound for the retailer?—That would not leave a margin when it was brought over to this country.

1162. But you can get it into this country at 2*s.* 6*d.* a cwt. right away from Denmark to London. As regards the citizens of these places being apathetic, do you suggest that it is because they are, some of them, really interested in the sale of these goods?—It is very difficult to exactly state the motives that prevent people carrying out the Adulteration Acts; it is not only in produce,

Mr. *Kearley*—continued.

produce, but in every other article it is the same.

1163. Would it in your opinion be an unpopular thing to rigorously enforce these Acts?—No, I do not think it would; but I think it is a very mistaken idea that it might cause momentary unpopularity to some individual.

1164. But it would really be the act of the collective body, would it not?—Yes. Well, in some of these towns it is very difficult to get things done.

1165. I think I understood you to say that the samples which were taken by your association were chiefly from the smaller shops?—We chose all the small shops, and of course some of the big shops as well; we chose the shops that sell nothing but butter, but we particularly went round all the smaller shops.

1166. But you did not exclude altogether from your observation large shops?—No.

1167. And you are in favour of the suggestion set forth by the Agricultural Association that travelling inspectors would be beneficial for the effective administration of these Acts in those localities where the local authorities fail to put them in full working?—I am.

1168. And you were rather more fortunate, I think, were you not, in the fines that you succeeded in getting, than the majority of the local authorities; I think you mentioned that you had succeeded in getting a man fined as much as 15*l.*?—Yes; that was, I think, because he had had a previous conviction.

1169. But there were three others fined 5*l.*?—Yes.

1170. Has it been discussed by your association that the inadequacy of the fines inflicted in many cases tends to encourage adulteration?—Certainly.

1171. And has any opinion been expressed as to the advisability of inflicting imprisonment after repeated convictions?—I do not think that we have suggested that, but we thought that if there was a minimum fine as well as a maximum fine it would be a good thing.

1172. Would you consider that it would be an undue hardship for a man to go to prison who persistently adulterated?—Not if he were convicted over and over again.

1173. Then you referred to the action taken by the Danish Commissioner; I presume it would be Mr. Faeber?—Yes.

1174. Can you tell me as to whether he prosecuted under the Margarine Act, or under the Merchandise Marks Act?—That I cannot tell.

1175. Of course, under the Merchandise Marks Act it would be for false description; under the Margarine Act it would be for selling an article as butter which was not of the nature and quality of butter?—I think it was the Margarine Act; I am not certain. I had some correspondence with him.

1176. I am rather inclined to contradict that, if you will excuse my doing so; I think it was really under the Merchandise Marks Act?—I cannot tell you of my own knowledge which it was; I have forgotten.

Mr. *Kearley*—continued.

1177. I suppose that your association would admire the action, and they may have expressed their admiration of the action, of the Danish Government in keeping a Commissioner over here to protect their product against unscrupulous traders from selling a counterfeit of their butter?—Certainly; I think it is very beneficial, and also it was the first means that we had of bringing the Gloucester Corporation to book.

1178. You may have heard incidentally that Mr. Faeber has conducted many prosecutions in different parts of the country against vendors who sell as Danish butter something that is not Danish butter, and is, moreover, adulterated with margarine?—Yes.

1179. And that he is employed by the Danish Government to protect their interests, as you are probably aware?—Yes.

Mr. *Kilbride.*

1180. I understand you to say that your association have no objection at all to the sale of margarine for what it represents, at all events?—No.

1181. Have you read the Bill that was introduced by Mr. Horace Plunkett and Mr. Dunbar Barton to amend the Margarine Act; it contains this provision; will you kindly read it, and say if it exactly meets the views of your association (*handing the Bill to the Witness*)?—Yes, that meets our views exactly.

1182. "On and after the commencement of this Act it shall not be lawful to colour margarine either by the introduction of any colouring substance or by any colouring process in its manufacture or in its preparation for sale, or to mix it with butter that is artificially coloured, and no substance sold as butter shall contain any other fat than butter fat." That is exactly the view of your association?—Yes, it is.

1183. You said that the English people desired to have a high-coloured butter?—I do not say high-coloured; but butter with a certain colour.

1184. Do your association object to have butter coloured?—No; they do not object to it one way or the other.

1185. I take it that your association do not consider the colouring of butter adulteration?—No.

1186. Would you hand over the administration of the Sale of Food and Drugs Act to the parish councils and county councils?—That is what it is at present.

1187. I thought that the objection given here by witnesses before was that this Act was not put in force by the existing local authorities?—No, it is not; but then at present it is under the county councils and town councils.

1188. Would you hand it over to the parish councils?—No, I do not think it would be any advantage.

1189. You are of opinion, are you not, that there are not enough local inspectors?—I think that you want some outside influence to make local bodies who have no interest, or no wish to carry out these Acts, to do their duty.

Mr. *Kilbride*—continued.

1190. Would you give the Local Government Board compulsory powers over these local bodies?—Yes, I think that would be preferable.

1191. What price in your opinion would pay a dairy farmer as an average price for his butter all the year round?—It would be very difficult to answer that; it must depend very much upon various circumstances.

1192. It was suggested to you that adulteration, or the sale of margarine, was not the cause of the low price of English butter at present; that the low price of English butter was due to prices fixed in Copenhagen, which are regulated by a board?—That was suggested to me.

1193. Is it your opinion that the fact of a large quantity of adulterated butter going into the market, being known to the board in Copenhagen, the board in Copenhagen in other words knowing that they have to compete in this country with an adulterated article, that knowledge influences the Butter Board in Copenhagen, and compels them accordingly to fix a lower price for putting pure butter than they otherwise would if there were no adulterated article sold over here?—I have no doubt that they suffer in the same way as we do as producers.

1194. So that the sale of the adulterated article sold here as butter necessarily reduces the price of pure butter in Copenhagen?—It naturally must reduce the price all over the world, I think, of pure butter, when so much adulterated butter is sold as pure butter.

Mr. *Yerburgh.*

1195. There is one point that I want to clear up. I understood you to say that out of the 15 samples that were found to be adulterated amongst the 64 which you took, from those same shops from which those samples were taken by the analyst on behalf of the corporation, only four dealers were convicted; is that so?—Out of the 15, I think, that we found to be adulterated when the Public Officer of Health took the samples, only four gave evidence sufficient to ensure a conviction, and only four were prosecuted.

1196. So that, although, when your buyer went round, he or she obtained samples from those 11 shops whch gave, I understand, from 20 to 50 per cent. of foreign fats, yet when the buyer of the corporation went round and took samples, the samples that the corporation official obtained did not give sufficient evidence of adulteration to enable him to say that there was adulteration?—Yes.

1197. Therefore that goes to show that your contention that the corporation officials are too well known to obtain adulterated samples is correct?—Yes.

1198. Upon the question of the colorisation of margarine, I want to ask you whether you were aware that New Hampshire has an Act of 1885 for colouring artificial butters pink?—I believe I was aware that some State, I will not say that particular one, had passed such a law.

1199. And that New Jersey has an Act of 1886 under which no colouring is allowed?—I was not aware of that.

Mr. *Yerburgh*—continued.

1200. Then are you aware that in 1887 the attention of the Russian Government having been drawn to the increasing production of oleo-margarine, certain regulations were drawn up by the Minister of Imperial Domains, amongst which were the following: That margarine fat shall be dyed some bright colour, but in no case shall such colour be yellow; and, in another clause, that the vessels in which margarine is packed at the manufactury shall be dyed the same colour as the margarine?—I was not aware of that provision about the vessels.

1201. Are you aware that these provisions have been submitted to the Medical Council of the Minister of the Interior, and the Medical Council proposed that margarine fat should be dyed red by means of the rind of the alkali root or with alkaline, and that the cases or firkins in which the oleo-margarine is contained and despatched should be coloured red?—No; I was not aware of that.

1202. Can you tell me whether you are aware of any expression of opinion in France as to the colouring of margarine?—I remember reading a report of a deputation which waited upon the Minister of Agriculture to suggest that the margarine should not be coloured, and should not be allowed to be mixed with butter, and the answer that he gave to the deputation was that it would destroy the butter trade with England.

1203. Are you familiar with any expression of Danish opinion upon the same point?—Not of my own knowledge.

Colonel *Bagot.*

1204. I understood you to say that the officially regulated price of pure butter in Copenhagen ruled the price of butter in the English market?—No, I did not quite say that. I said that I believed that you would often find butter sold in the provincial towns of England at a price which left no margin over the official price at Copenhagen.

1205. But, practically, do you think that the price at which foreign butter can be sold to the merchant, plus the carriage, gives the standard of the price of English butter?—No, I think it is very often sold below that.

1206. Then you thought, so far as I understood, that the low price of English butter was to a large extent due to adulteration by certain other fats, margarine, or whatever it is, in foreign butter?—Yes; and with butter generally.

1207. Could not English butter be adulterated in exactly the same way, and consequently be under exactly the same circumstances, and provision, so far as regards price, with regard to the adulteration with foreign butter?—Of course you can adulterate English butter just as you can foreign butter.

1208. Then you think that the adulteration of foreign butter keeps down the price of English butter?—I said that the adulteration of butter keeps down the price of English butter.

1209. Not of foreign butter particularly?—Any butter that is adulterated must keep down the

Colonel *Bagot*—continued

the price of butter, whether it is foreign butter or whether it is English butter.

1210. Is it not a fact that the merchants deal mostly with the foreign butter manufacturers because, owing to the butter passing through factories, which assimilate all the various kinds coming from farms, they can get a regular supply; whereas, if they buy it in England, as there are no factories or practically very few, they never can get a regular supply, as the butters vary greatly in quality?—Our large dealers demand absolute uniformity; now absolute uniformity is impossible with pure butter; you can get very near uniformity, but absolue uniformity at all times of the year, which you may say our large dealers demand, is impossible with pure butter.

1211. But what I meant was this: is it not much easier to get very much more uniformity from dealing with a foreign country which passes its butter through those factories where the produce of a large tract of country is amalgamated, than to buy it in the English market towns, where it passes through no factory at all?—The blending house butter is of course more uniform; but there is also a great facility and a great temptation when you mix butter, to mix something else with it.

1212. But in this country we do not practically have any system of blending?—No, we do not have a blending house, and I hope we shall not.

1213. You think that that would be adverse to our butter interests?—I do not think you would get the best butter; you get a uniform butter no doubt from a blending house.

1214. But is it, or is it not the fact, that the large butter merchants cannot deal with the English farmers (I am speaking on general principles) because they are not able to get uniformity in the same way as they can when dealing with Denmark, or other places abroad, where there are blending houses?—There is no doubt that it is a difficulty. It is impossible to get an absolutely uniform article of butter from various different makers; but it is quite possible to get a practical uniformity which is quite good enough for the English people. But the big dealers have boycotted English butter so much that the people in London hardly ever get the opportunity of tasting English butter.

1215. But I do not suppose that any merchants boycot any class of produces for any reason except business reasons?—I will give you an instance of that. I went to one of the best-known West End London butter merchants, and I took him a sample of my own butter, and I said to him, "Would you be prepared to take any butter from me?" He looked at it, and said, "I should be obliged to give that away; none of my customers would touch it; they will not eat anything bnt Brittany butter." I give you that as an instance to show you the popular view.

1216. That was in London, you say?—Yes, with one of the largest dealers in London.

1217. The same thing would not occur probably in Liverpool, Manchester, Birmingham, or one of those large provincial towns; or do you think it would?—I have never tried yet. I took this to one of the best known men in London, and that was his answer to me: "I should have to give it away."

Colonel *Bagot*—continued.

1218. Have you overheard it said in the country districts that there is not a good sale for what we in London should call the best butter, because it is too rich?—No; but you want different butters for different parts of the country.

1219. That is what I mean?—For instance, if I was sending butter to London, I should make it differently from what I should if I was going to send it to Liverpool. In London they like butter practically without salt, rather an insipid butter. In the North of England they want butter with more taste to it.

1220. Do you know that in the North of England what we should buy as the best butter in the West End of London would probably have little or no sale at all in north-country towns?—Very likely.

1221. For that reason?—Yes.

1222. There is one question that I did not quite understand. I gathered that your association thought that a town council or corporation did not carry the Adulteration Acts into force to the extent that they ought to do?—That is so.

1223. The town councillors, for instance, would be elected by working men, and consumers as a general body, who would be interested, of course, in having pure goods; is not that so?—They ought to be.

1224. I mean to say that they are, as a matter of fact, elected by the bulk of the voters in the ward of their town, who would probably be working men all of them?—And small shopkeepers.

1225. Then the leaders of opinion anyhow in those wards, the people who would make speeches and conduct these elections, would as a rule be small or large shopkeepers in the town?—Yes.

1226. And they, of course, would not be inclined in their speeches or when putting forward local politics before the electors, to allude to the subject of adulteration, because it is a matter which would only affect their own particular body; is not that so?—That is rather difficult to say.

1227. I mean that the bulk of the leaders of opinion in the ward, of a town which elected a town council, would be tradesmen?—Yes, tradesmen.

1228. And consequently not very likely to put the question of adulteration to the fore?—No, I should think not; I have never seen it mentioned.

1229. Do you not think, therefore, that the town council for that reason is naturally a body that would be not very anxious to press the adulteration question?—I do not think they are.

1230. And you are decidedly of opinion that outside Government inspectors of some sort should be appointed to obviate that?—I think they want outside influence brought to bear upon them; they always express themselves as very anxious to carry out the Acts, but they do not do it.

Colonel *Bagot*—continued.

1231. You said that your association formulated 12 recommendations on the subject of adulteration, did you not?—No; I said that the Central Chamber of Agriculture formulated them (it was not our association), in connection with the British Dairy Farmers' Association, of which I am a member.

1232. Can you say from your experience on the subject where margarine is chiefly used in a large quantity?—Where it is chiefly mixed with butter, do you mean?

1233. Either margarine itself, or butter adulterated with margarine?—In our towns.

1234. In what sort of places?—Places where they sell butter.

1235. Is it not used chiefly in restaurants and certain classes of hotels and eating-houses?—I should think it was very largely used in such places.

1236. Where it is only seen spread on bread?—Of course it is very difficult to say what you are eating when you get a little piece of something or other.

1237. Do you not think that those are the chief places where either margarine pure or butter largely adulterated with margarine is used?—I think it is very likely where it is used, but it has to be bought from somewhere.

1238. That is when you want to test it for adulteration; but the places where it is used, I believe, are in these restaurants, certain classes of hotels and eating-houses?—Yes, I think it is very likely.

1239. And if you coloured margarine with any peculiar colour, that would put an end to the cheap food that they can provide in those places?—If it was coloured pink I do not think that people would eat it.

1240. That is what I mean. These restaurants and eating-houses provide tea and bread and butter at extremely low prices, of course; do not you think that the bread and butter is bread and margarine?—I daresay.

1241. And if the margarine were coloured pink it would put an end to that business at those prices?—Very likely.

1242. On general principles you are against colouring margarine with any particular colour?—As a producer, I should say most certainly, coloured pink or any other colour; but as a practical man I do not think it is a practical suggestion.

1243. Only one other question. Have you any knowledge as to how many factories of margarine there are in the country?—No; I do not know; I believe they are on the increase.

1244. Do you think it is mostly made abroad or in England?—A good deal is made in England at the present time.

1245. And is the manufacture increasing?—I think that the production of it is increasing in England.

Mr. *Kearley.*

1246. Can you give us the name or the locality where there is a margarine factory in England?—There is one, I believe, just put up on the Great Western line within the last few weeks.

Mr. *Bolitho.*

1247. May I ask whether you have any knowledge of the quality of butter being made more uniform by the use of factories; would you be surprised to know that the price of butter has been levelled upwards by the use of factories?—That might be. You will get medium butter from factories, and the general price might be levelled up; but the very best butter you get from private dairies.

1248. Would you be surprised to know that in a certain locality where the price of butter was extremely low, by the use of factories it is now as high as the price of best butter in London?—I daresay, if the quality improved; very likely the quality was very bad before.

Mr. *Kearley.*

1249. On this question of factories, will you define what you wish us to understand as a factory. You mentioned the blending-house and the factory. Do you draw a distinction between the two?—Yes, I do, I call a factory a place where milk or cream is dealt with and made into butter or cheese. I call a blending-house a place where butter is collected and mixed together, and coloured, and made up.

1250. Then a factory is a creamery where milk is separated by the centrifugal process?—Yes.

1251. Do you say that these factories do not make uniform butter?—No, I do not say that.

1252. I beg your pardon. Do you say that that is the most uniform butter that is made?—I should think it would be; but when I said that absolute uniformity is impossible, I meant to say by that that you cannot make the same butter in June that you do in December.

1252. That would apply to all butter, would it not?—It would not apply to a mixed butter.

1254. Butter mixed with margarine and other things, you mean?—No, it would not apply to that.

1255. Have you any idea of the total production of butter in England as a commercial quantity?—No, I cannot give you figures off-hand.

Mr. *Yerburgh.*

1256. I believe it is a fact that Lord Vernon has a butter factory?—Yes, for butter and cheese.

1257. Do you know from your experience the price that the butter made at Lord Vernon's factory commands in the market?—No, I do not know what price it commands.

Mr. *Jeffreys.*

1258. Just a question about colouration. It would be wrong to say that all English butter is coloured, would it not?—Yes, certainly.

1259. Butter made from rich milk from Jersey or Guernsey cows is naturally coloured, of course?—Yes, when I said that butter is coloured I meant in the winter, and on particular land. Some land, of course, will give much darker coloured butter than other land.

1260. But it would be wrong to say that all English butter is coloured, as somebody has suggested?—

Mr. *Jeffreys*—continued.

suggested?—Yes, a great deal of English butter is never coloured at all, but in the majority of pastures when you have your cows in the house in winter, and fed on roots, you cannot get yellow butter.

Mr. *Jeffreys*—continued.

1261. As it would be impossible to prevent the colouration of foreign butter, it would be very unfair to prevent the colouration of English butter, would it not?—Yes.

Mr. GEORGE EMBREY; Examined.

Chairman.

1262. You are Public Analyst for the County and City of Gloucester?—Yes.

1263. And you are also District Analyst under the Fertilizer and Feeding Stuffs Act, 1893?—Yes.

1264. And you a Fellow of the Chemical Society, and Analyst to the Dairy Produce Defence Association, the Sanitary and Economic Association of Gloucester, the Barton Regis Sanitary Authority, and the Horfield Local Board?—Yes.

1265. And you were lately a member of the Council of the Society of Public Analysts?—Yes.

1266. How long have you been a public analyst?—Ten years.

1267. And you have made during that time how many analyses of butter and milk?—About 3,000.

1268. You have an opinion that the amount of adulteration is much greater than that which has been detected, have you not?—Yes.

1269. In what proportion would you say?—I should say that about 25 per cent. of all the butter which is sold is adulterated.

1270. And of that how much is detected?—Not more than 10 per cent. of the whole.

1271. And you think that an alteration of the law might stop this adulteration?—Yes.

1272. How would you alter the law for that purpose?—First, by giving greater latitude to the inspectors who make the purchases.

1273. What do you mean by greater latitude?—It is almost impossible for a man to purchase adulterated butter, at least, in the cities and towns with which I am acquainted; the vendors recognise at once that he is an inspector, especially if he be a police constable disguised.

1274. So that you mean by greater latitude opportunities of employing other persons rather than the regulation officials?—Yes.

1275. Then you would have samples of butter imported into this country analysed on landing?—Yes.

1276. So that we should actually know what was sent in?—Yes.

1277. And if that were done, you think it would diminish the amount of spurious butter?—From our experience with the tea, I have no doubt that it would.

1278. Then, as to the local authorities, is there anything with regard to their action that you would suggest?—Local authorities should be compelled to purchase a certain number of samples, that is most important.

1279. In any locality where the local authority is not active in enforcing the Adulteration Act, you wish for some other power to be able to step in and interfere with them?—Yes, outside officials to do the work for them.

Chairman—continued.

1280. That is to say, that rather than trust your local government of this country, you would appeal to some central authority?—Not entirely, but in some things; in this case I would.

1281. In this case you think that the central authority are more to be trusted?—Not necessarily, but to pull up the laggards; it is not general of course; in our county, for instance, the work is done very efficiently; 500 samples are purchased every year, and done very well, I believe; but in certain places it is done badly.

1282. But you think that at all events there ought to be some means greater than there are at present of compelling local authorities to take more notice of the Acts that they have to enforce?—To stimulate them, in fact.

1283. You made in Gloucester an experiment in 1892, of which we have heard already from a previous witness, with regard to the adulteration of butter with margarine, or the sale of margarine as butter. Can you give us some information about that, in addition to that which we have already received?—In 1892, 64 samples were purchased by a properly trained buyer.

1284. What do you mean by a properly trained buyer?—It very frequently happens in small places that if a woman who is not known asks for half a pound of butter, she gets it, but if she goes two or three times to the same shop, after the second or third time she gets a mixture instead of butter. In this case we selected a woman whom they would be hardly likely to suspect, and we found that she bought butter the first time, but margarine the second.

1285. Of these 64 samples we have already heard that 15 were found to be margarine?—Yes varying between 20 per cent. of added fat, and being almost entirely foreign fats.

1286. Then you had samples purchased in those same shops for the purpose of being referred to the public analyst?—Yes, by the sanitary inspector.

1287. Of those 15 samples, how many were adulterated?—Five were adulterated.

1288. So that it comes to this; that out of 15 places where adulterated butter was sold to your properly trained purchaser, in only one-third of them afterwards was adulterated butter sold to the public officer?—Yes, and even then he employed a woman to ask for the butter.

1289. Was that due, do you think, to the fact that they had been warned by previous purchases, or was it due to some clumsiness in the method of carrying out the purchases?—It was mainly, I think,

Chairman—continued.

think, due to slowness and clumsiness in carrying out the purchases, giving time for a notice to be sent round from shop to shop informing them, in the words of the letter, that the Philistines were about.

1290. By Philistines I suppose they meant the public officials?—Yes.

1291. In the early part of 1893 you tried the same experiment at Cheltenham, did you not?—Yes.

1292. Were the results different?—Out of 68 samples only seven were found to be adulterated.

1293. So that the proportion was considerably better at Cheltenham than at Gloucester?—Not half so great.

1294. The proportion of honesty in dealing was higher, that is to say?—Yes.

1295. How do you account for that?—That in Cheltenham the samples are regularly purchased for analysis, so many per month.

1296. By the authorities?—Yes.

1297. So that cases of adulteration are more liable to detection than in a place like Gloucester, where the Acts are not so efficiently carried out? Just so.

1298. You would allow inspectors to have greater liberty in employing persons to make purchases for them?—Yes.

1299. In fact, that they should be able to act under deputies properly selected?—Yes.

1300. And in addition to that you would like some other method of inspection of the authorities themselves?—Yes, compelling them to purchase a certain number of samples.

1301. Every year?—Per month. If you say per annum, they perhaps buy a batch all at once, that would have no value. I would compel them to purchase at least once a month.

1302. Are you aware that the Local Government Board has tried to get the local authorities to purchase one sample per 1,000 inhabitants?—Yes.

1303. And that that has been exceeded to a considerable extent, that that standard has been attained and passed by many localities, especially in London?—Yes, and in our own county we buy more than one per 1,000.

1304. Have you any reason, from your scientific experience and experiments, to suppose that adulterated butter is mostly used in hotels and restaurants?—It is very largely used in such places.

1305. Is that a matter of opinion?—No, from my own analyses of samples which I have brought away from such places, even in high-class hotels.

1306. Have you anything to say about the addition of antiseptics to foreign butter?—I think that the addition of antiseptics should be prohibited, not only in foreign but in English butter, and in fact in all articles of food.

1307. The two antiseptics that are used are salicylic acid and boric acid?—Most largely.

1308. There is no evidence that either of them is injurious, is there?—I think it follows that an antiseptic must of necessity weaken digestion if it is constantly used, or why call it an antiseptic?

1309. Have you any scientific evidence or facts in regard to that?—I know from experiments on myself that the constant use of butter containing salicylic acid will tend to produce indigestion after a few weeks.

1310. That is, of course, a question?—Yes, and it would act differently with different people, of course.

1311. It is difficult to make an experiment of that kind, and arrive at an accurate scientific conclusion?—If the experiment were repeated often, and always with the same result, I think you could arrive at a fairly accurate conclusion.

1312. I admit that there is a higher degree of probability, but it is not an absolute fact, such as you can get in the science of chemistry?—No.

1313. With regard to boric acid, you have no evidence that it is injurious to health?—No, I have no absolute evidence, but as it acts as an antiseptic it must of necessity produce the same result as any other antiseptic in killing the organisms which we require to bring about digestion.

1314. It is given largely in medicine, is it not?—Yes; but medicine is not food; all medicines, I take it, are evils.

1315. But it is given without injurious effects?—Apparently. I would draw a distinction between medicine given for a particular purpose and an antiseptic given in small doses daily.

1316. But the doses that are given as medicine would be larger than the quantities of boric acid used in butter?—Yes.

1317. You think that the present Sale of Food and Drugs Act breaks down in consequence of shopkeepers sometimes producing a warranty as provided under Section 22 of the 1875 Act?—We frequently lose cases through that.

1318. And there is no way of proceeding against persons who give a warranty?—They are not proceeded against.

1319. And you would have them proceeded against by a more stringent enforcement of the Act?—Where a man is dismissed by producing a warranty under Section 22, I would compel the authorities to prosecute the man giving a false warranty.

1320. As to the mixture of moisture or water with butter, have you had any experience of that as a form of adulteration?—English butters, so far as I can learn that they are English, rarely contain more than 16 per cent., but some of the coarse very salt Irish butters contain as much as 22 per cent.

1321. And you regard anything over 16 per cent. as adulteration?—As a useless addition, and therefore an adulteration.

1322. You have had also a good deal of experience, have you not, in milk analyses?—Yes.

1323. You have handed in to me here a Table of a number of analyses of milk made during the years 1893 and 1894?—Yes.

1324. Those have been all made by you for the county of Gloucester?—Yes, by myself.

1325. As analyst for the county?—Yes.

1326. Have any of these cases been prosecuted?—No, because I consider that each of those

Chairman—continued.

those cases of milk I am warranted in calling genuine milk.

1327. That is to say, that in all those cases the standard of the solids and the standard of the fats has been above the minimum which would justify your saying that they were adulterated?—Yes.

1328. Have you had no samples in 1893 and 1894 of adulterated milk?—Yes.

1329. Why do you give me these, then, instead of the record of those others?—Merely as a suggestion that pure milks do not fall below a certain standard.

1330. That standard, you are aware, is a matter of considerable controversy and great difficulty between experts?—Yes; I do not think there ought to be any difficulty in the matter.

1331. You would say that a standard might be fixed?—Easily fixed.

1332. And at what would you put that standard?—11·5 per cent. for the total solids, and 3 per cent. for fats.

1333. Would not that lead to this in many cases, that persons selling a perfectly honest milk obtained from the cow with no addition of water to it might come under your standard very considerably?—Not if the cow has been properly milked.

1334. But we have had evidence given us here from authorities the other day that samples vary greatly, when they are milked all in the the same way?—For individual cows, but not for a whole herd of cows. The sample submitted to the public analyst would be sure to be of mixed milk, and not from a single cow.

1335. But it might happen in this way, that a man might have one cow and sell the milk thereof, and under your system, if it happened to be an old cow, or a cow giving very poor milk, he would be liable to prosecution and conviction for selling a perfectly genuine article, because it did not come up to your standard?—There are many cases put forward where it is stated that the cows give milk of an abnormally low quality, but when they are closely investigated (and I have investigated a good many myself), it has always turned out either that the cow has been specially fed, or that she has not been properly marked; that is only my own experience. Only quite recently I was invited by a farmer to see a herd of cows milked; he was summoned for adding 25 per cent. of water to the milk, and he was quite sure that the cows gave that quantity. On the first occasion he succeeded in cheating me through my not being able to watch his operations closely enough; on the second occasion he very nearly succeeded in cheating me again, but when we had the cows properly milked it came out that the milk came up to 11·9 of solids instead of 10·5.

1336. How did he cheat you?—It is very difficult for one individual to watch two men milking a whole herd of cows, and if you cannot watch the operations of the two men they may escape detection. In the first case I was perfectly certain that I had been cheated from the composition of the milk, and therefore I demanded to have the cows milked a second

Chairman—continued.

time, and the second milking proved that I had been cheated the first time.

1337. He cheated you, I suppose, by putting water into it?—Into the can before he began, or rushing away very quickly out of my sight.

1338. You adhere to that view of yours, then, that it is within the power of analysts and public authorities to lay down a standard for milk such as you have mentioned, which would not inflict hardship on honest people?—I do; I think 11·5 per cent. is the lowest standard, and I do not think it would pay them very well to risk watering to bring it to that. In exceptional cases analysts should of course consent to visiting the farm and seeing the cows milked, under proper conditions. That might be provided for, if any body pleads such a case; but I do not think that it will ever occur.

1339. Are you aware that Dr. Wanklyn some years back, and the Inland Revenue Authorities recently, have suggested a much lower standard than yours?—Mr. Wanklyn's standard can have no value now, because his method of analysis is obsolete, and was always clumsy; it was good for his time, but is not now. As regards the Somerset House tables the most recent set differ very much from their earlier set. They have given us two sets, and the more recent ones, I think, support my view of 11·5 per cent. of solids, certainly in the case of mixed milks. I cannot remember very certainly, but in the list of mixed milks I do not think that one falls below 11·5 per cent.

1340. Then you would make your standard to apply not to the milk of individual cows, but to mixed milk taken from the herd?—Yes.

1341. In all these cases which you have put in as examples of analysis, 43 in number, I find that the total solids are generally above 11·5 per cent. rising in some instances as high as 13 per cent.?—Yes.

1341*. The percentage of fat is invariably 3 per cent. or above?—Yes.

1342. So that the standard suggested to us by the Inland Revenue the other day from Somerset House of 2·5 per cent. for fats, and 8·5 per cent. for total solids, is too low a standard in your opinion?—Yes, so far as my experience goes.

1343. It would permit too much of fraud?—Yes.

Mr. *Channing.*

1344. You consider that a standard of 11·5 per cent. for total solids is a general fair average?—Perfectly fair.

1345. In the case of a cow whose milk you were decived about, you found on the second visit that the amount was actually higher?—11·9 per cent.

1346. Are you aware that the French and American standards are considerably higher than the standard which you have named of 11·5 per cent.?—Yes, I think the American standard is a specific gravity one; that is to say, that a 100-gallon can representing mixed milk must have a certain specific gravity, but it works out higher than the standard which I have given.

Mr. *Channing*—continued.

1347. Have you worked out, and could you state to us what it would proportionately represent, allowing for the difference?—No.

1348. Anyhow, the standards employed in foreign countries are in your opinion more severe tests than the one that you have recommended, 11·5 per cent.?—Yes, but the analysis of milk in other countries, so far as we can get it, appear to show a better milk than English milk; that is to say, that the milk in foreign countries appears to be richer. Whether it is owing to their methods of analysis I cannot say.

1349. Has the Society of Analysts expressed any opinion within your knowledge of any variation in the method which would account for that?—I cannot tell. I believe that the English chemists generally adopt the best method for milk analysis. I do not know whether it is quite general abroad yet.

1350. In your opinion the risk of watering down to the 11·5 per cent. standard would be too great for a man to contemplate?—Yes; it would not pay, it is too risky; they would be sure to go below with poor milk.

1351. I think you have a strong opinion as to the use of colouring matter, in order to disguise thin and poor milks?—I think that colouring matter in milk ought to be prohibited; we always find it in the poor milks.

1352. I think you stated with regard to Cheltenham that the authorities there take monthly samples of butter?—Yes.

1353. And of milk I presume?—Yes.

1354. What procedure do they take as to persons who take the samples?—Do you mean their general practice, or in this special case?

1355. I mean their general practice?—Generally, a constable is sent from some other part of the county to Cheltenham to make the purchases; he is disguised in some way, and then goes from shop to shop.

1356. As to the presence of salicilic acid and boric acid, have you determined the quantity which is present in samples of butter?—There would not be more than a few grains per pound.

1357. Have you any evidence to give us as to what occurred when the Danish representative, Mr. Faeber I think it was, inspected the district with which you are acquainted?—Mr. Faeber came to Gloucester and visited some of the Gloucester shops, especially those selling Danish butter, because he had an interest only in that; he disguised himself, and he failed to buy from those shops anything but pure butter; although he made two attempts. It was for him that we got the purchaser I have spoken of, to enable him to purchase samples; and as soon as we had succeeded we had no difficulty in getting any number of adulterated samples from the shops that I have referred to. But of course his prosecutions were under the Merchandise Marks Act, and there you are not compelled to notify to the sellers the object of the analysis, so that it is much easier to get a prosecution in that way.

1358. In your analyses of the 64 samples that you went into in connection with this defence association you stated the proportion of foreign fats present, did you not?—The lowest percentage of foreign fat was 20 per cent., but most of them were over 50 per cent.

Mr. *Channing*—continued.

1359. I want to ask you upon that your own opinion as an analyst and chemist as to the satisfactory working of the tests which you employed to determine the quantity of foreign fats present. Are you satisfied with those tests?—I think that where the proportion of foreign fat is great we have no difficulty in determining the percentage within 5 per cent., but where you have a large quantity of butter, and a small quantity of foreign fats, then I would not like to say that we should be certain nearer than 10 per cent.

1360. Are you aware that at the Grocers' Federation meeting at Belfast, a strong opinion was expressed in favour of prohibiting mixtures altogether?—I am not acquainted with that.

Mr. *Jeffreys*.

1561. In testing milk what did you mean by speaking of "properly milking"?—The first portion of the milk of course contains very little fat; the last milking contains a greater amount of fat.

1362. Therefore, of course, it is important that you should watch the cow?—Certainly; and that you should be sufficiently acquainted with farm practice to know when they are stripping.

1363. With regard to the standard of milk, would there not be rather a danger if you fixed 11·5 per cent. of solids, that rich milk, such as you get from Guernsey and Jersey cows, might be watered down to that standard?—In exceptional cases there might be; but as a matter of fact we must fix a standard now.

1364. I want to ask you whether it would not be a dangerous thing to fix any standard, because the richer milk would be watered or adulterated down to that?—But they may do it and they do do it now, and we have no remedy.

1365. You think that in any case it would be better to fix an average standard?—Yes, a reasonably low standard would be safer than none at all.

1366. I believe that sometimes condensed milk and skimmed milk are mixed together; what is the standard of solids in that sort of milk, do you know?—That is to say, making milk up by mixing condensed milk with water?

1367. With skimmed milk?—I do not see the possibility of a standard in that case; it is not a natural product.

1368. Such an adulteration could be easily detected, could it not?—Yes, because most condensed milk has sugar in it and you would not have much difficulty in detecting that. I do not think they have succeeded in making condensed milk without any sugar to preserve it.

1369. With regard to margarine, of which you said so much was sold in hotels and restaurants, how can those places be prosecuted for using it; have you ever thought of that?—I do not see well how they can be prosecuted, unless the inspectors be permitted to enter such places and take samples. Under the present law I do not see how they can be prosecuted, but if the inpector be authorised to enter any such places and seize a portion of butter, and pay for it in the usual way, perhaps it might be accomplished.

1370. But

Mr. *Jeffreys*—continued.

1370. But if he only took the bread and butter provided for customers, then you do not see how, under the present law, the hotel-keeper could be prosecuted?—But usually the butter is brought in separately from the bread, except in coffee houses.

1371. And you are strongly of opinion that women should be employed to obtain the samples in the shops?—For some articles.

1372. For butter?—Yes. In the case of spirits women would be useless.

1373. I meant for butter?—Women or even young children might be usefully employed in the case of butter.

1374. Have you found in your country that the chief constable authorizes women to go and procure samples for the police?—I believe that he has only done so on one occasion; he objects to it.

1375. But it would be very advantageous would it not, if he would do so in all cases?—I think so.

1376. But notwithstanding that, you think that the Local Government Board should urge the county authorities to prosecute in more instances, or to take samples in more instances?—Yes, I think that they should define a minimum number of samples which shall be purchased.

1377. Does the Local Government Board take any notice of counties or corporations who do not institute these prosecutions?—Yes, they occasionally call their attention to it by circular.

1378. And has that circular any effect, do you know?—Not that I am acquainted with.

1379. Therefore you think that larger powers should be given to the Local Government Board?—Yes, to compel the authorities to take more samples.

Mr. *Colman.*

1380. You referred to the question of colouring milk, and said that you thought it should be prohibited; have you had any case of colouring in milk; have you ever detected colouring in milk?—Yes, frequently, it is most easily detected; ordinary individuals can detect it without the slightest difficulty.

1381. And is milk, as a matter of fact, coloured much before it is sold; I am not asking about butter?—There are certain districts, I would instance Cheltenham, where the milk sellers have a difficulty in selling milk if it is too pale, so that they colour it specially to give it the appearance of rich milk. It is invariably the case that the coloured milks are the poorest; rich milks are rarely coloured.

1382. Have there been any cases of prosecution for coloured milk?—I do not think that you would be able to prosecute, because the colouring is harmless; it is generally annatto which is used, and it is quite harmless, so far as I know.

1383. What proportion, then, of milk sold would you say is coloured?—I should say that probably half the milk sold is coloured in towns. In country places it is rarely coloured.

1384. Then, as to the samples of butter which you found to be adulterated, have you any knowledge whether they were of home or foreign manufacture?—The only means of knowing would be by asking the dealer, Where has that particular kind of butter come from; and in that way we do get some information which may be reliable or may not; for instance, we can generally recognise what we believe to be Italian butter, and I think that analysis will always enable us to distinguish Australian butter. There are certain differences in butters, and although our knowledge is not always accurate, we can usually distinguish the place of origin from which the butter comes, but not with sufficient accuracy to say absolutely that it is so.

Mr. *Colman*—continued.

1385. As a matter of fact, do you think that these samples which you have referred to as having found them to be adulterated were foreign or English butter?—I believe that in nearly every case they were foreign butters.

1386. You want greater latitude to the inspectors. Are you aware that under one of the decisions of the High Court it is not necessary that the officer or inspector should personally procure the sample, but that he may employ whom he pleases to do so?—But he must complete the purchase himself; so far as I understand the decision, he may employ an agent to ask for it, but he must complete the purchase himself.

1387. And in that respect, if it is as you say, you think that the law wants further alteration?—Yes, I would have it made more elastic.

1388. Then I do not think I understood your answer, as to some grocers' federation at Belfast? I think my answer was that I was not acquainted with their action; I do not know anything about it.

1389. Then you did not make any statement about it, because I am informed that the statement was not quite correct, as it was suggested to you?—No, I did not.

Sir *Mark Stewart.*

1390. You stated just now that the colouring of milk by annatto was perfectly harmless?—I should say so.

1391. Is there not some acid in annatto which is injurious?—The quantity used is so slight, you see, that it would be almost impossible to estimate the quantity, and therefore I should say that it would be harmless in the quantity used.

1392. But if a jar of annatto is corked by an ordinary cork, is it not the fact that in a very few months' time the cork will be eaten away by the acid?—I am not acquainted with that; I do not know that; I know that I have jars of annatto which have been kept for years, and that that has not been the case.

1393. Of course more annatto would be required to colour butter than milk with the object of bringing it up to a very high colour?—That would depend upon the colour of the butter in the first instance, of course.

1394. You do not consider that the small amount of annatto that is used would be injurious to health in any way?—I do not.

1395. Have you had any experience of adulteration of margarine, that is to say, by the addition of margarine to butter?—Yes.

Sir *Mark Stewart*—continued.

1396. My point is rather this, that margarine is very often sold as butter, is it not?—Yes.

1397. Have samples of margarine often come under your observation which are supposed to be butter?—Samples of margarine have been purchased as butter and submitted to me for analysis.

1398. Is that frequent?—Yes, very frequent.

1399. And what remedy would you suggest in regard to margarine sold in small quantities?—If it is sold as margarine there can be no objection whatever to that.

1400. But you could not suggest anything that an Act of Parliament could do in order to prevent small quantities of margarine, a few pounds for example, being sold as butter?—I think that the suggestions which I have made would be quite competent to prevent the sale of it in that way.

Mr. Kearley.

1401. I think you told us that you diagnosed the samples that you purchased, and which were found to be adulterated, to be chiefly butters of foreign importation?—Yes.

1402. You gave an opinion that much of this adulteration could be detected at the port of entry?—Yes.

1403. And that that would prevent the circulation of the adulterated article?—Yes.

1404. Is that the unanimous opinion amongst analysts?—I cannot say; I have never discussed the question with my fellow analysts.

1405. Do I rightly understand you to say that it is reasonably possible to form an idea as to the source of origin of butter at the time it is being analysed?—Within certain limits, yes, but only in the way I mentioned. I will give you my own case: I see a particular kind of butter of a certain colour put up in a certain form, and having a certain composition, and I ask the dealer where that butter comes from, and he tells me that it is Italian; I cannot be certain that it is. Then another dairyman who introduces Australian butter, sends me a sample, and says, "Would you like to know the exact composition of this"?—In that way one does get a certain amount of information, but it is not very accurate.

1406. I understand you to say that from your own experience you have found in your own particular locality that the Acts are not being worked so fully as they might be?—I think that in the county of Gloucester the Act is very efficiently worked, and if the inspectors had more latitude as regards the employment of agents, all would be well; but in the city of Gloucester it has not hitherto been worked as it should have been, although some little energy has been shown recently; they are moving in the matter somewhat.

1407. Do you think that the percentage of adulteration diminishes or increases according to the amount of activity displayed in the working of these Acts?—Largely in proportion to the number of samples purchased, whether they be analysed or not even that reduces the number.

Mr. *Kearley*—continued.

1408. And that can be supported, I believe, by statistics?—It can.

1409. I do not know whether I am correct in assuming that the inspectors who purchase samples require the permission of the local authority by whom they are employed before they can themselves employ agents or deputies to purchase samples from the vendors; is that so?—As they are entirely under the direction of their superior officer, they would not do it as a matter of policy without his sanction.

1410. They must really get his assent?—Yes.

1411. Do you know whether it is left to their discretion?—No; they are directed what to do.

1412. The rule would be, subject to exceptions of course, that the inspectors purchase the samples themselves?—Yes.

1413. And they resort to disguises?—As well as they can; they are fairly successful.

1414. But you think that it would be more efficacious if they were to make a habit of employing deputies?—Yes.

1415. And you think that something more is required than that which is aimed at under the Local Government Board circular of purchasing one sample per thousand; you think that the buying should be continuous, and should represent more a monthly percentage?—A monthly percentage at least.

1416. In order to prevent all those samples being bought perhaps in one month?—Yes.

1417 As regards the use of preservatives have you any idea of the percentage that is employed in butter?—Salicylic acid is generally used in the proportion of three or four grains per lb.

1418. What percentage does that represent per cwt.?—It would be something under an ounce per cwt.

Mr. *Channing.*

1419. How general is the use of salicylic acid as a preservative?—It is rarely used in English butter.

1420. Is it present in most of the samples of foreign butter?—Yes, in some foreign samples it is pretty general.

Mr. *Kearley.*

1421. It is practically universal in foreign butters, there is no doubt?—Yes.

1422. Seeing that we are dependent to a large extent on imports of foreign butter for our supplies, do not you think that it would be hurtful to the continuance of those supplies were the use of preservatives prohibited?—The Danish butter is very rarely preserved; it rarely contains salicylic acid. Therefore if the Danes can make good butter without preserving it, why cannot other nations?

1423. Of course, the colonial butter comes a long distance?—Yes, and that is always preserved.

1424. And frozen too?—Yes.

1425. So that it appears that the colonial importers find it necessary to put preservatives in their butter, notwithstanding the fact that it

Mr. *Kearley*—continued.

is brought over in chilled chambers?—Because their methods are not so good as those adopted in Denmark.

1426. That is your opinion?—That is my opinion.

1427. You mentioned that sometimes prosecutions are defeated by reason of warranty being pleaded, and you would suggest that the guarantor should be joined in the prosecution with the vendor, I think I understood you to say?—No; I think that the vendor should be discharged, and that the person giving the guarantee alone should be prosecuted.

1428. Are you not assuming straight away the word of the vendor before giving the guarantor an opportunity of putting a defence on record. Would you advocate that the vendor should be discharged the moment that he raised the question of warranty?—No; he should give notice that he will rely upon it as under the present Act, and then the case should be heard.

1429. Then it would be necessary, would it not, in every case to join the guarantor in the prosecution, in order that the justices might determine as to whether the defence set up by the vendor was a good defence or otherwise?—That would be a very convenient plan; it would be a more reasonable plan.

1430. It would not do at once to dismiss the vendor because he raised the question of warranty?—No.

1431. There are many warranties, of course, that are given by importers who reside in foreign countries; could you suggest how they should be got at?—Vendors rarely buy from such people; they usually buy from the English merchants or wholesale dealers.

1432. But supposing that the wholesale merchant is impugned, he would buy from the importer; he would buy his produce, say butter, for instance, in Denmark. There are plenty of people who distribute butter in retail ways that buy direct from the source of production?—Yes.

1433. And consequently their guarantee would have to be a foreign guarantee. Could you make a suggestion as to how that should be dealt with?—I would hold them responsible, because they ought not to be allowed to carry on such a business unless they were capable of judging whether a thing is what it is represented to them to be.

1434. You think that a foreign guarantee should not be a valid defence on the part of the importer?—Certainly not.

1435. Now as regards the standard of milk. I understand that you are a public analyst?—Yes.

1436. Have you, as a public analyst, any opinion as to the influence of Somerset House upon the execution of the Sale of Food and Drugs Act?—There is no doubt that the low standards that have been fixed by Somerset House have tended to prevent public analysts from reporting samples as adulterated which they were quite sure were adulterated.

1437. Would that be from a fear that on appeal Somerset House would not agree with the decision of the public analyst?—Disagreement with Somerset House is a serious matter to a public analyst; it is almost ruin. In small places, where a man was not particularly strong, one case of his being reversed by Somerset House, although he may be perfectly correct in his analysis, would very likely mean losing his office.

1438. Have you any opportunity of ascertaining the standards of Somerset House?—Only in a few cases where they are called to support their certificate, where they are asked questions; in a few such cases we get some notion of their standards, but we have no direct method.

1439. You simply assume it by the revelations that come out in prosecutions, and admissions made then?—Yes; if I were to write to the authorities at Somerset House, and ask for their standard, they would not give it me.

1440. Is it within your knowledge that there has been any official communication by the society to which you belong to Somerset House, asking for this information?—Yes.

1441. What was the reply, do you know?—I cannot remember the words, but the reply was that they were unwilling to carry on the correspondence; a number of questions were submitted to them; I am hardly prepared to give you the details of it, but several questions were submitted to Somerset House, and they were asked to meet the analysts in a certain manner, but I believe that the result was a direct refusal to help us in any way.

1442. Now as regards the theory or the fact that it is consistent with milk coming direct from the cow that the milk shall be so lacking in the necessary essentials that it shall be worse, or as bad, as an adulterated sample, how would the setting up of a uniform or minimum standard affect such milks? Ought not that to be taken into consideration in setting up a hard and fast standard?—I think that exceptional cases may easily be dealt with in the manner that I have suggested.

1443. As regards dairy farms where the product of the herd is mixed, that is to say?—There is no evidence in dairy farms that the milk has ever fallen below 11·5 per cent. of solids. In the exceptional cases of particular cows which have been specially fed, or which are not in good health, or in certain conditions in relation to calving, that could be easily met in the manner that I have suggested.

1444. And in addition to cases where cows are in bad health, or suffering from bad feeding, do I correctly understand you to say that it is quite possible to milk, we will say, a cow that is known to give very good results in such a way at the commencement of the milking that it would give a milk that would be almost devoid of fat?—Yes, that is so.

1445. You, no doubt, in your professional capacity, have studied the action of continental and colonial authorities in connection with the setting up of milk standards?—I do not know that I have specially studied it.

1446. Have you ever seen the analyses carried out by Veith, the celebrated analyst?—Yes; I

Mr. *Kearley*—continued.

am acquainted with such as have been published in the Journal of the Society of Public Analysts.

1447. Am I correct in saying that his research extended to no less than 150,000 samples of milk?—Yes.

1448. And that he gave as his opinion the setting up a standard much higher than even that approved by the public analyst?—The standard abroad, do you mean?

1449. That he showed by these returns that the average standard was higher than that which you have mentioned?—That is so.

1450. So far as regards Dr. Wanklyn's figures, they are too old to be worth considering, as you say?—Yes; the method by which the figures were obtained is now quite useless and quite obsolete.

1451. Was I correct in understanding you to say that in America they adopt a standard of specific gravity?—Yes; in New York, I believe, a churn containing 100 gallons is the smallest quantity that is allowed to enter the city, and the specific gravity is simply taken of the milk in that churn.

1452. I may be quite wrong on this, but I venture to ask you whether specific gravity is not another way of expressing total solids?—Scarcely. As the cream, the fat, increases the specific gravity diminishes, and as the curdy matter increases the specific gravity increases also; so that you may get water and skimmed milk, and get the same gravity as the other.

1453. With regard to water in butter, you fix the maximum percentage that should be allowed at 16 per cent.?—Yes.

1454. Do you find butter from any particular point more full of water than from other districts?—Australian and New Zealand butters rarely contain more than 9 to 10 per cent.; the very coarse salt Irish butters do go up to 18 and 20 and 22 per cent. Italian and Danish butter and the usual English butter average from 12 to 16 per cent.

1455. You think that 16 per cent. could be safely fixed as the maximum?—Yes.

1456. What would be the cause of such a high percentage of water being present in Irish butter: would it be accidental or occasioned by mistake?—If I answer that it can only be from reading the results of the recent trial in Manchester, where, as you know probably, many methods were given by the witnesses there. It was suggested that in hot weather a large quantity of brine had to be used in the preparation of the butter, and they gave that chiefly as the reason why the butter contained so much water.

1457. Have you examined samples of creamery butter made in Ireland?—Not to know that they are such.

Mr. *Kilbride.*

1458. I suppose of your own knowledge you know nothing whatever about Irish butter?—You are right.

1459. How much salt, in your opinion, is necessary to preserve Irish butter?—I can give it you in percentages.

1460. What is the proportion?—Not more than 2 per cent. It would depend upon the time it is kept, of course.

Mr. *Kilbride*—continued.

1461. The length of time that it was intended to be kept, you mean?—Yes.

1462. Would you say that for butter which it was intended to keep for three months, 2 per cent. of salt would be sufficient?—I do not know that I have the means of answering such a question; that is rather a question for a butter dealer; a chemist would not usually keep the butter three months. I could give you my opinion, but I am afraid that it would not be of any value.

1463. What proportion of moisture is necessary to keep salt in a state of solution?—I must recollect the solubility of salt in water before I can answer that, and I afraid I cannot remember that figure; one does not carry about piles of figures.

Colonel *Bagot.*

1464. May I ask you, as regards the amount of water that is in butter, does not it very much depend upon the way that the butter is made. I mean to say that butter made by a certain process, not as well as it might be made, would contain more water in it than butter made by a good process, although the person making it would not have any intention of adulteration?—Undoubtedly, if it is worked well, they get the water out of the butter.

1465. Therefore a great deal of Irish butter that has a good deal of water in it might be really badly made butter, according to modern ideas?—It may be so.

1466. With regard to your local analysis, you stated at the beginning of your evidence that the Adulteration Acts were more enforced in Cheltenham than they were in Gloucester, I think?—Yes.

1467. At Cheltenham the Acts would be carried out by the County Council?—Yes.

1468. And at Gloucester by the Corporation?—That is so.

1469. Do you think that the better carrying out of the Adulteration Acts at Cheltenham over Gloucester is owing to the fact that in the one place they are carried out by the County Council and in the other by the Town Council?—I think it is accidental.

1470. What class of people do you think that the Town Council, generally speaking, would represent?—They are from most classes; there are some shopkeepers, and some professional men, and some merchants; they are drawn from various classes.

1471. Would they not as a general rule represent shopkeepers and tradesmen?—Of the 35 members of the Gloucester Corporation I do not think that more than five or six are shopkeepers. I am trying to think of the individuals. Five or six of them are shopkeepers.

1472. Are you of opinion that a local body such as a town council might find it a rather invidious task to enforce the Adulteration Acts too much?—Yes; I think it is exceedingly difficult in a small city for the corporation to carry out the thing properly, because it may be that

Colonel *Bagot*—continued.

that some of their own body are people who have been adulterating; it does so happen.

1473. It might possibly bring discredit upon some of their own friends?—Yes.

1474. Who might be found guilty of adulteration without meaning it?—Yes; and as the direction to purchase frequently comes from a particular committee, people know when the purchases are going to be made.

1475. Therefore you are decidedly of opinion, I understand, that some Government inspector should be able to assist local bodies in carrying out the laws, or to strengthen them in some way?—I think it is quite necessary.

1476. To stimulate them, I should say?—Yes.

Mr. *Kilbride.*

1477. How is it that you arrive at the standard of 16 per cent. as the proper standard of water in salt butter?—Because I have never met with what I have known to be an English butter, either salt or fresh, that contains more than 16 per cent., however good it was.

1478. Do you know the standard of water in butter at Somerset House?—We cannot get at their standard. Occasionally in certain prosecutions they have said 16 per cent., and 18 per cent. was fixed once.

1479. Are you aware that it has been given in evidence before this Committee that Somerset House has no standard of water?—I am not aware of that. Somerset House officials have given evidence, and fixed certain standards in trials.

1480. Would you hold that salt butter containing more than 16 per cent. of water was adulterated?—I should.

1481. Would you hold that water was added with the intention of adulteration?—Or carelessly added, without knowing that it would increase the weight.

1482. In other words you would say that the water was not sufficiently extracted?—Just so.

1483. The only reason why you come to that conclusion is, because in your experience of English butter more than 16 per cent. of water has never been shown in salt butter?—Yes.

1484. And because more than 16 per cent. of water has never been shown in English salt butter, therefore Irish butter containing more than 16 per cent. of water is adulterated, in your opinion?—I think that is a fair conclusion.

1485. Do you think that the climate has anything to do with the quantity of water that there is in butter, climatic conditions at the time the butter is made?—It has been said so, but I cannot say of my own knowledge; nor do I know of any great variation between the climate of Ireland and that of the extreme West of England. The climate of the extreme West of England in humidity of temperature is very much like that of Ireland.

1486. Have you been much in Ireland?—I know it fairly well.

Mr. *Kearley.*

1487. Do you know the climate of Denmark?—No, I do not; I have not been to Denmark.

Mr. *Kilbride.*

1488. You stated, in answer to the honourable Member opposite, that your experience of New Zealand and Australian butter was, that it only contained from 12 to 14 per cent. of water?—Not that much; it rarely exceeds 12 per cent.

1489. Do you think that the dryness of the Australian and New Zealand climate has anything to do with that?—No, I do not; I think it has to do with the excellent manner of making it, which is revealed by breaking through a piece of butter, and looking at it.

1490. Then I understand that the butter makers of New Zealand and Australia are far beyond the butter makers of England?—The butter is more uniform in character.

1491. You say that the only reason why there is only 12 per cent. of water in it is due to the fact of the excellent making?—It is better made butter.

1492. But there is more than 12 per cent. of water in English butter?—Yes.

1493. Does it follow from that, that in Australia and New Zealand butter is better made than it is in England, because it has less percentage of water in it?—The Australian and New Zealand butter brought to this country is certainly better made than the average English butter.

1494. I am surprised to hear that, I must say?—I do not say that the flavour is such as will be accepted by Englishmen, but it is certainly much better made butter.

1495. Have you any opinion to give the Committee with regard to the colouring of margarine; whether the colourisation is in your opinion an adulteration? I would prohibit colouring in everything.

1496. Either in margarine or butter?—In margarine, butter, milk, or sweets; in anything I think it is a mistake, because it opens the door to an immense amount of fraud. The colouring is put in to simulate something else. Even in the case of butter, I can remember 40 years ago when coloured butter would not have sold in Birmingham; the taste and demand was for something very nearly white, as white as it could be made. It may have changed since then, but I well remember that the butter was nearly always white like tallow.

Colonel *Bagot.*

1497. At that time there was little or no foreign butter imported, was there?—No.

1498. And the case is quite different now?—No doubt. At the time that I am speaking of, the high class farmhouse butter made in Warwickshire were made without any colouring at all; in fact, had they put colour into them the people would have been suspicious: but that is changed now.

1499. And because foreign butter would be coloured, the English butter if uncoloured would not sell?—It would not.

Mr. *Kilbride.*

1500. But you would not hold that colourisation in butter is adulteration?—Yes, I would, though I could not report it as adulteration.

Chairman.

1501. That is only your personal opinion?—Yes.

Mr. *Kilbride.*

1502. At what temperature do you think that butter ought to be made to contain only 12 per cent. of water?—I am not a butter maker.

1503. You do not care to answer the question?—No; I am always about in farms, but I am not a butter maker.

Colonel *Warde.*

1504. I think you stated that the chief difficulty that the inspectors and analysts have to deal with in procuring samples, is owing to the fact that their purchasing agents are known or suspected, so that they are often supplied with a better article than that sold to the general public?—Yes.

1505. Would it be advisable that the persons purchasing for the authorities should be empowered to seize any sample that they may select for analysis instead of having to purchase it?—I think in the case of butter it is very necessary that the inspector should go into the shop, and take up any parcel he pleases and tender money for it, and have an analysis made. That would answer almost every purpose in the case of butter.

Mr. *Lambert.*

1506. Why did you say just now that it was almost as much as an analyst's situation was worth to quarrel with Somerset House?—I say that if Somerset House happens to reverse his decision, if he happens to be not a very strong man, or a new man serving a small authority, the inference and the reasonable inference would be that he was wrong and Somerset House right; but it may not be so, and is not always so.

1507. Somerset House or their advisers, I presume, would be composed of competent analysts?—I should say so from what I know of them.

1508. Would it be at all the general rule that the local analysts would differ from the Somerset House analysts?—I have never had any conflict with them myself, but there certainly have been cases of disagreement.

Chairman.

1509. In referring to hotels and restaurants, and the sale of adulterated articles there, especially adulterated butter, are you aware of any prosecution that have been instituted against those bodies?—I believe that Marylebone or Clerkenwell, in one of those two districts of London, some prosecutions have been instituted against coffee-house keepers.

1510. And in Birmingham?—I do not know of any in Birmingham.

1511. Do you know the result of any such prosecutions?—I believe that convictions were obtained in London in the case of coffee houses.

1512. Against those people for selling margarine as butter?—Yes.

Sir *Charles Cameron.*

1513. I am just going to ask you one question. You mentioned just now that you thought it would be a great improvement if the inspector could take his own sample in the case of butter, and not be dependent upon what was served out to him?—Certainly.

1514. So that is a principle that you would apply to everything, or would you confine it to butter?—It is not so necessary in the case of other things, but in the case of butter it would meet the whole difficulty.

1515. You are aware, surely, that under the Margarine Act the inspector can demand a sample without going through the form of purchase; he has that power already?—But he cannot seize it.

1516. But he can demand it, and refusal is not possible?—I do not know why it is, but the authorities prefer to proceed under the Sale of Food and Drugs Act rather than under the Margarine Act.

1517. But you make a demand decidedly in the case of butter; you do not extend the principle, or at all events you do so with reserve. In the case of butter there is the power which you ask for, and if it is not availed of it is not a defect of the law apparently, but simply from unwillingness on the part of the authorities to avail themselves of it?—Yes.

Colonel *Bagot.*

1518. With reference to those hotels and eating-houses and so on, is it not the case that the adulterated butter would be used in the kitchen, and for eating purposes spread on bread, and so on, but that it would be almost impossible to obtain a sample of it, because they do not sell butter?—Margarine is put on in many cases, I am certain. I have taken samples myself, and analysed them, and I am certain that margarine is put into the little round pats that are put on the tables for customers.

1519. Could not the inspector go into one of those eating-houses and take one of those pats?—I do not know.

1520. Do you know how the prosecutions were obtained in Marylebone that you alluded to?—I believe that the inspector went into a coffee-house and asked for sixpennyworth of bread and butter, and then said that he was going out into the country, and would prefer to have the bread by itself, and the butter by itself. I believe that was the course adopted.

Mr. *Kilbride.*

1521. You stated something about the Manchester cases; are you aware that it was proved in the Manchester cases, and sworn in court, that a sample of butter made at McElligott's Creamery in Kerry, analysed with the newest and best appliances, was, immediately after it was made, found to contain more than the standard percentage of water than you have set up?—It was very little over 18 per cent. I read the whole of the evidence, but, so far as my memory serves me, it was very little over 18 per cent.

1522. You

Mr. *Kilbride*—continued.

1522. You suggested that the cause of so much moisture being in Irish butter was due to the fact that it was not so well made as English or Foreign butter?—I was referring to the coarse salt butters made and sold at very low prices.

1523. I ask you whether you are aware that that butter was made at McElligott's Creamery in Kerry with all the latest appliances, and that a sample taken immediately after it was made was proved to have a higher percentage of water than that which you have laid down as your standard?—I do not remember that particular fact.

Mr. *Kilbride*—continued.

1524. In that particular case, at all events, you could not hold that it was badly made butter, or owing to the want of the very newest and best appliances?—I cannot say without knowing the case.

Wednesday, 18th July 1894.

MEMBERS PRESENT:

Colonel Bagot.
Mr. Dunbar Barton.
Mr. Bolitho.
Mr. Channing.
Mr. Colman.
Sir Walter Foster.
Mr. Frederick Frye.
Mr. Herbert Gardner.
Mr. Jeffreys.
Mr. Kearley.
Mr. Kennedy.
Mr. Kilbride.
Mr. Lambert.
Sir Mark Stewart.
Colonel Warde.
Mr. Whiteley.
Mr. Yerburgh.

SIR WALTER FOSTER IN THE CHAIR.

Mr. RICHARD BANNISTER re-called; and further Examined.

Mr. *Channing.*

1525. THERE was a question which you wished to consider further with regard to the testing of the fats by the saponification method, whatever that may be; I asked you a question as to the figures used by the American analysts, and especially as to the number of 227 millegrammes of potassium hydroxide to test the quantity that butter would absorb, as compared with other fats that absorb less; and I think you said that if I asked you the question to-day you would answer it?—I shall be very happy to do so. The 227 millegrammes there mentioned is in connection with a test called the Koettstorfer's test, and the number is 227; that refers to butter fats. But when we come to look at the table itself we find that that 227 is the average of the butter experiments; the minimum is 221·5 and the maximum 232·4. I think you will find that the average of those two figures is 226·9.

1526. May I ask over what range these experiments appear to have been taken; over a very large range, or over a limited range?—Over a very large range of different kinds of butter, and also of different kinds of fat. I thought you would like me to work out the results as given above when I explained the difficulty that there was of determining a small quantity of foreign fat in butter. If we take those figures, the minimum figure of 221·5 and the maximum figure of 232·4, between them you would be able to put into the better descriptions of butter about 30 per cent. of foreign fat to make it come up to the higher one.

1527. That amount could be let in without detection?—Without detection.

1528. Would it be of use if you were to state the average figures for the other fats?—I cannot remember about the other fats; lard-oils, and he oils to which the test was applied.

1529. The oil, I understand, takes a larger quantity, but the organic fats which are used for adulteration take a less quantity, I understand?

Mr. *Channing*—continued.

—Koettstorfer's number for the butter fat is 221·5 to 232·4, and in the case of arachis, or earth-nut oil, it is 191·3 to 196·6; cocoa-nut oil 246·2 to 268·4, palm-nut oil 220 to 247·6; but, so far as this test is concerned, after looking it over very carefully and trying it ourselves, and also after comparing the results of other examinations by other chemists, it is put on one side as not being a sharp test for the detection of foreign fat in butter.

1530. Am I not right in thinking that the figure for the ordinary fats used in the manufacture of margarine, which are introduced as adulterants into butter, would be very much less than 227?—Yes, it would, but in some cases higher.

1531. What would be the figure?—If you will allow me, I will look at the full table; I have got the authority here. In the case of lard it would be 192·0 to 196·5; tallow, 193·2 to 198·0; butterine, 193·5 to 196·5; and butter fat, as I said before, 221·5 to 232·4.

1532. By butter fat you mean the fat present in pure butter?—Yes.

1533. I do not speak as a chemist or analyst, but does not the relation of those figures of the adulterating fats seem to range from 190 to 198, and of butter from 221, I understand you, up to 240; does not that test therefore at once mark off the fat present in pure butter from adulterating fat?—No, not sharply; there are other facts to be taken into consideration in connection with the equivalent of the fats that are present; and, after a very careful examination of the process, it has been abandoned as not being a sharp test for the presence of foreign fats in butter.

1534. What is the sharpest test that you do apply?—I think that the sharpest test of all is the estimation of the soluble acids in butter, that is to say, the acids soluble in water.

1535. Is that the test that you referred to when you said that you had to take the physical condition of the butter into consideration as well as the results of the analysis?—That is so.

1536. With

Mr. *Jeffreys.*

1536. With regard to the solids in milk, I see you stated that the standard might be 8·5?—Will you kindly tell me the number of the question?

1537. It is at page 39, Questions 591 and 592?—Yes, I have it.

1538. Would not that be rather a low standard?—For some descriptions of milk, yes.

1539. Another gentleman, an analyst, Mr. Preston Thomas, told us that he would suggest 11·5?—That is for solids not fat and fat.

1540. What would you make your standard for solids not fat and fat?—We make it 8·5 for solids not fat, and 2·75 for fat.

1541. Would you not be afraid that if you appointed a standard of any description, say 11·5 for total solids, there would be a great fear of rich milk being watered down to that standard?—There is no doubt that there would be.

1542. How would you avoid that, because it would be clear adulteration?—I am rather opposed to fixing a standard for milk, because we get some milks that are very rich in solids not fat and fat, and there is no doubt that persons who sell the milk to the public water those milks down to something that they think will pass the standard of 8·5 and 2·75.

1543. Can you detect when a rich milk is watered down to this standard, by the adulteration of water in it?—We cannot.

1544. Neither can you when it is adulterated with skim milk or separated milk?—We cannot quite.

1545. Still less in that case could you?—There would be a different relation between the solids not fat and the fat. The solids not fat will largely increase, and the fat will be rather extraordinary in its relation to the solids not fat. For instance, it may be in this way: that you would have solids not fat 9 or 9·2, and the fat would be down perhaps to 2·75 or 2·80.

1546. Then if we were to fix a standard by Act of Parliament, there would be a great fear, would there not, lest adulteration should be legally increased?—Yes; and there is a difficulty on the other side as to whether you would exclude cows that were not giving a milk which came up to that particular standard or limit.

Mr. *Kearley.*

1547. What standard do you suggest that the people will have watered down to, the lowest known standard?—No, they do not water down, as a rule, to the lowest known standard, because they have to compete with their neighbours; therefore they have to take two things into consideration, the watering down, and also the price at which the milk is sold.

Mr. *Jeffreys.*

1548. But at the present time, if any water is added to the richest milk it is still adulteration, and punishable as such?—It is still adulteration, and punishable as such.

1549. Therefore, I suppose if Parliament were to appoint any standard, you would yet reserve the power to punish people who were detected in adulterating milk with water?—That power ought to be reserved.

Mr. *Jeffreys*—continued.

1550. Otherwise, of course, as you said just now, all the rich milk would be adulterated naturally down to the standard?—There is no doubt about it.

1551. And in your opinion it would be rather unwise to appoint a standard at all?—I am not in favour of a standard.

1552. That is from your experience?—That is from my experience

1553. With regard to the milk as it comes from the farmer, in your experience is it adulterated by the producers, the farmers, or is it adulterated by the retailers?—I think it is adulterated chiefly by the distributors, the retailers.

1554. It comes to them to a great extent pure, you think?—It comes to them to a great extent pure. There is no doubt that some farmers do adulterate, but I think it is the exception, not the rule, for them to adulterate.

1555. With regard to butter, may I ask you are samples of imported butter taken by the customs officers and analysed?—I have made inquiries since I was here last week, and I find that they are not, not so far as the Adulteration Act is concerned. Where there is any error in the description, or the locality, or anything of that kind, then samples may be taken; but I am told that, so far as adulteration is concerned, samples are not taken by the Custom House officers.

1556. Would it not be a very wise step if samples of foreign butter were taken by the Custom House officers?—It is a very large question, and requires a great deal of consideration, because there is a great quantity of butter imported, and it is a perishable article and requires careful handling.

1557. I do not mean taking samples of every cargo that is landed; I mean taking samples generally or occasionally, as samples are taken now by inspectors in towns?—There is this difference between the two: that in the one case it is done by the local authority, and in the other case it would be done by the Government; and up to the present time the Government have not done it as part of their duty.

1558. But do you recommend that they should do it; would not that be rather a check upon this importation of adulterated butter?—I am strongly in favour myself of the Adulteration Act being made as stringent as possible, and working under it, rather than interfering with the butters at the place of import.

1559. But would it not be much more easy to detect the adulterated butter at the port of import than when it gets separated throughout numerous shops in the metropolis?—Yes, that would be so; but there is this point to be considered in connection with that: that all the butter that is imported, unless it is salt butter, and fresh butter is generally imported, has to be at a certain market at a certain time, and therefore there is a great responsibility involved in detaining samples of butter for the purpose of analysis unless it does turn out that the butter is adulterated. Take a case in point. Some years ago there was some tobacco imported into this country, and a charge was made that it was adulterated. It was found afterwards that it was not, and the next thing was that the importer took action against the

Mr. *Jeffreys*—continued.

Government, and recovered a heavy penalty; and the butter importers would do exactly the same thing.

1560. Yes; of course, the Custom House officers who examined those samples would have to be very careful; but it seems to me that if the samples of butter could be taken and examined at the port where it is landed, it would save a great deal of trouble afterwards in the examining of the butter, because it would be examined in bulk?—Yes, but it would have to be distributed before the result of the analysis was known, I dare say.

1561. You could not provide for that?—No.

1562. How long would it take to analyse a sample?—You must have two or three days for the purpose of analysing it.

1563. At least?—Yes. There is a difference between the importation of spirits and tea and the importation of butter in this respect; the butter can be imported into any port, but tea and spirits only into certain ports; and it follows then, as a matter of course, that we should have larger sampling, and then there would be a difficulty in sending up samples to the central authority for examination, which would all take time and seriously prolong the examination.

1564. Then, butter being a perishable article, unless it could be analysed in less than two or three days it would be impossible to do it at the port?—But even in two or three days some of the fresh butter would be dreadfully damaged.

1565. That is what I mean; and, therefore, unless you could discover some easy and expeditious way of testing it, it would not do to test it at the port?—That is my opinion.

1566. With regard to margarine, does not Section 8 of the Margarine Act authorise the Custom House officers to take samples of margarine at the ports?—Yes.

1567. Is that done?—I do not know that it is, except under the Trade Marks Act.

1568. You would know, would you not?—I saw a late Custom House report, and I saw that a very small number of samples had been taken; about 38. It is evident that they could not be systematically taken, otherwise there would be a greater number than that.

1569. They take samples under the Sale of Food and Drugs Act, I think, not the Margarine Act?—I think under the Margarine Act.

1570. Ought not this Margarine Act, in your opinion, to be put more in force?—That is for the Government to settle, and not for me.

1571. I mean in your opinion, as an official, would it not be more efficacious in testing samples?—There is no doubt that it would be more efficacious.

1572. As this power is given in the Margarine Act, many people think that the same power should be taken for testing samples of butter; but from what you say there is a difference, because margarine, I suppose, is not a perishable article?—Now margarine includes all mixtures of the ordinary margarine and butter; they must be called margarine; and some of the margarine imported contains a considerable quantity of butter, and is perishable.

1573. Then when the Custom House officers test it, and they find that it is bad, do they stop the package of margarine; do they test it there and then before it is distributed?—I think they do not stop a package of margarine on account of its badness, but only if there is any contravention of the Trades Marks Act, because all mixtures of butter and margarine must be labelled "Margarine."

1574. Following up what you said just now, if the Custom House officers discover that a sample of margarine is adulterated, yet before they have had time to seize the package it has been distributed amongst the shops, is not that so?—I think the point about the margarine really is as to whether it is correctly described, or not; as to whether the margarine is imported as butter, and not imported as margarine.

1575. But then does it take any time to find out whether it is margarine or butter by analysis?—Certainly.

1576. How long?—Margarine is not of a definite composition, because you have margarine mixed with different proportions of butter; and the question really to settle is whether the so-called butter does contain any foreign fat.

1577. But, as you said just now, if a sample were tested, and it was found that that margarine was untruly described, before it could be stopped it would be distributed amongst the shops?—Yes, it would.

1578. Therefore the same difficulty in testing margarine at the port would apply to butter?—It would apply to butter, but there is no doubt that the difficulty of testing either butter or margarine at the port is very great.

1579. I think you said something about the analysing of butter; is there any analysis made at Somerset House at all of butter?—Yes, we examine samples of butter for the India Office, and other Departments; we take samples ourselves for examination; and we have also samples of butter for examination which are referred to us under the Adulteration Act.

1580. You promised to give us the number of the samples that you take?—I have brought the number of the samples that I spoke of last week, as getting some from the market that contained foreign fat. There were some samples of Hamburg factory butter which were guaranteed to be genuine; there were five of them, and we found that they contained from 20 to 40 per cent. of foreign fat. We also examined them for moisture, and we found that the moisture varied in them from 19·56 to 21·50.

1581. What should you say was the standard of water that is allowed in butter?—There is no standard of water that is allowed in butter.

1582. But what is the general amount that you find in butter; the maximum which is allowed in butter, without counting it as adulteration?—In salt butter 16 per cent., or a little over.

1583. And in fresh butter?—It would be from 12 to 14 per cent.

1584. And in the butter that you have examined, is most of the adulteration in foreign butter amongst the samples that have been taken at Somerset House?—We cannot trace the origin of all the butter that we examine.

1585. You have no list made up of that?—No, we have no list made up. Those are foreign butters that I described just now.

1586. They

Mr. *Jeffreys*—continued.

1586. They were stated to be foreign?—We know from their history that they were foreign butters, and had been manipulated at Hamburg.

1587. Have you tested any that were marked "English butter"?—Yes, we have tested butter marked as "English butter."

1588. What proportion of adulteration have you found in them?—I do not know that we have found any.

1589. Then generally speaking most of the adulteration is found in foreign butter?—Yes, so far as we are concerned.

Mr. *Bolitho.*

1590. Do you know whether in those countries from whence butter is exported, and where a bounty is given when the butter is exported, they send also any record of the composition of the butter; do they send any document showing that it is genuine?—I do not know that they do; I cannot answer that question.

1591. Have you ever come across any of the Australian butter which arrives in large quantities?—Yes, I have got the analysis of a sample of Australian butter here. There are two here for comparison; there is one a sample of British dairy butter, and another a sample of New Zealand butter. The water in the British butter was 13·96 per cent., and in the New Zealand butter it was 8·85; the acids soluble in hot water were 4·97 in the British butter, and in the New Zealand butter 4·50 per cent.; insoluble acids in the British butter were 88·74; and in the New Zealand butter 89·36.

1592. Then you have not had, I think you said, many samples sent of butter taken directly from a farm?—We have had a large number of samples of butter taken directly from farms some years ago, when analysing home-made butter.

1593. But now they come through another source?—We have them for particular experiments, for the purpose of showing the variations in genuine butter through natural causes.

Mr. *Kearley.*

1594. With regard to the possibilities of inspecting butter at the port of entry, you think, as I understand, that there would be difficulties in the way in consequence of butter being a perishable article?—I feel sure that there would be great difficulty in the way.

1595. Do not you think that a sample package from a consignment might be detained during the analysis, or rather that observations might be made by taking samples, and that by those means the Customs would be in a position to await further arrivals, and, acting on the data that they had ascertained, they might confiscate the second arrivals?—That is a way out of the difficulty. Of course with the first importation there would be great difficulty in retaining that importation until the analysis was completed; but if the samples were taken from a regular importation of a particular brand of butter, the information obtained from the analyses, the first importation would be very useful in regard to the second, third, or subsequent importations.

1596. And in such cases it would tend to prevent the circulation of a fraudulent article?—

Mr. *Kearley*—continued.

There is no doubt that it would tend in that direction.

1597. You mentioned, I think, that the Customs have informed you that there had been some cases in which they had put Section 8 of the Margarine Act, or Section 2 of the Merchandise Marks Act into force in connection with butter that was suspected of being adulterated?—I heard that from a Custom House official.

1598. Did they tell you under what conditions these Acts were put in force; did they tell you how they came to be put in force?—They did not, so I cannot give you any information upon the subject.

1599. Did they tell you that any cargoes were confiscated by reason of the action that they took?—I heard that a cargo was confiscated, but I do not know the circumstances of it.

1600. As regards Section 8 under the Margarine Act, which says, "All margarine imported into the United Kingdom of Great Britain and Ireland, and all margarine, whether imported or manufactured, within the United Kingdom of Great Britain and Ireland, shall, whenever forwarded by any public conveyance, be duly consigned as margarine; and it shall be lawful for any officer of Her Majesty's Customs or Inland Revenue, or any medical officer of health, inspector of nuisances, or police constable, authorised under Section 13 of the Sale of Food and Drugs Act, 1875, to procure samples for analysis if he shall have reason to believe that the provisions of this Act are infringed on this behalf, to examine and take samples from any package, and ascertain, if necessary, by submitting the same to be analysed, whether an offence against this Act has been committed;" would that not, in your opinion, give the Customs power to inspect butter, or rather butter so-called, which has been consigned as butter, if they had reason to suspect that it was an adulterated article of margarine and butter?—I should say that it would.

1601. So that it does not necessarily follow that their powers are only to inspect those goods which are marked "margarine"?—No. I think they have got power under that Act to go further than they do at the present time.

1602. Would it be an offence under the Merchandise Marks Act to consign goods as butter that were not butter, but which might possibly be a mixture of margarine and butter?—I believe it would.

1603. That would be an offence under that Act?—Yes.

1604. Now, under Section 2 of the Merchandise Marks Act, the Board of Trade have the power of prosecuting offenders who consign goods as being something different from what they really are?—Yes.

1605. Do you know whether that section has been put into force so far as regards the importation of butter?—I do not know that it has. I believe that it has been put in force with regard to some silk goods, or something of a similar nature, in the midland counties. I know that there was a prosecution in the midland counties under that very Act, under the power given to the Board of Trade.

Mr. *Kearley*—continued.

1606. You mentioned that several samples had been referred to your Department by various Government Departments; can you tell us how many of those samples consisted of milk, and how many of butter?—I cannot, unless I refer to our books; but, so far as butter is concerned, we examine the whole of the butter that is used in the Admiralty hospitals, and also the butter that is bought for the use of the Admiralty, and for the India Office; so that we examine a goodly number of samples of butter during the year.

1607. Would some of that be tinned butter to go with the Fleet?—Yes.

1608. I ask you the question because those two articles, milk and butter, form the largest proportion of the samples mentioned by you as having been referred to you under the sale of Food and Drugs Act?—That is so.

1609. I notice that you mentioned two samples of water referred to you under the Sale of Food and Drugs Act; what water would that be?—That would be water referred to us under the Public Health Act by the magistrates.

1610. I notice that the Sale of Food and Drugs Act expressly excludes water?—Yes; we do not make a separate return of milk and water, but those samples were referred to us by the magistrates under the Public Health Act.

1611. With regard to the cases that you mentioned of your analysis differing from those of the public analysts, I think you said that in 474 cases you agreed, and that you disagreed in 188 cases; is that so?—Yes.

1612. Could you tell us whether this disagreement took place in the earlier stages of the working of the Sale of Food and Drugs Act?—I have not got the returns for every year, but I think I have got the return for the last three or four years here; and I looked at that and thought that there was very little difference. Disagreements in 1889, were 20·7 per cent.; 1890, were 30·7 per cent.; 1891, were 24·6 per cent.; 1892, were 23·4 per cent.; 1893, were 11·7 per cent.; 1894, were 25·3 per cent.

1613. Why I ask you is, that I notice in one of your reports it says, that a year or two ago you had 47 samples submitted to you, and that you disagreed only in two cases, so that it occurred to me that the disagreement was lessened?—There is no doubt that it was up to a certain time. I think last year there was a little difficulty about lard and vinegar, but if I remember rightly there was a steady decrease.

1614. That is to say, a steady decrease in the number of disagreements between Somerset House and the public analysts?—Yes.

1615. I suppose it necessarily followed that some of the samples submitted to public analysts would be wrongly reported upon by them?—No doubt.

1616. But in the general working I presume you are of opinion that the public analysts have done their work efficiently?—I think that during the last six or eight years of the working of the Sale of Food and Drugs Act, the work has been done remarkably well.

1617. And those differences that have cropped up between you have been (I am quoting from your evidence) differences rather more as to the interpretation of results than actual mistakes made?—Yes.

1618. That is to say, that from the same analytical results two analysts, both working accurately and honestly, may, and very frequently do, arrive at different conclusions?—They do.

1619. But taking your figures for the last 20 years, the average differences between the public analysts and Somerset House have not amounted, so far as my calculation takes me, to more than on an average 10 cases a year?—I daresay that is right.

1620. That is taken from your reply to Question 555, which has reference to milk cases: "In 311 cases we confirmed the decision of the public analysts, and in 96 we disagreed." I think that is about right?—Yes.

1621. In the results which you have given us of samples that have been referred to you, there were included samples from Scotland and Ireland as well as from England, I believe?—There were.

1622. But the reports of the Local Government Board, as I understand them, only refer to samples taken from England under the Sale of Food and Drugs Act?—I cannot answer that question as regards their return; our return includes for the whole of them; so that as far as the references are concerned it embraces England, Scotland, and Ireland.

1623. But I have looked at it rather carefully, and I make out that the Local Government Board's Report refers only to samples from England; the average of the samples taken and submitted to the public analyst since the working of the Act would be about 25,000 per year, roughly speaking, I believe?—I should say quite that.

1624. And you disagreed on an average with regard to one sample per 2,500?—That is in the reference.

1625. I would like to clear up one reply of yours here, in answer to Question 556, which may be subject to misconception, although I think I understand it clearly. You stated that you disagreed in about one quarter of all the cases; you do not mean in one quarter of all the samples taken, but only in those submitted to Somerset House as a court of reference?—My answer had nothing to do with the others, so that I hope my statement cannot be misunderstood.

1626. I only wanted to make it perfectly clear. There were 16 samples you told us sent up for a special purpose, not sent up under the Sale of Food and Drugs Act strictly; what were those 16 samples?—I cannot give you the particulars of them, but they were samples arising out of previous examinations; they were not really confined to samples that had been referred by the magistrates from defendants, but were referred for some special information that the magistrates wanted in connection with cases they had tried.

1627. You have had at Somerset House, outside the references that have come to you under the Sale of Food and Drugs Act, a large experience with milk and butter samples?—Yes.

1628. Would that be an experience as large and as varied as that of the public analysts?—The experience would not be so large as that of the

Mr. *Kearley*—continued.

the public analysts, because they are generally examining milk from morning to night, but quite as varied.

1629. But Somerset House is not continuously engaged in making examinations into a large number of samples of butter and milk?—We are continuously engaged in getting accurate results of examinations of butter and milk.

1630. But in a general way should I be overstating the case were I to suggest that the experience of the public analysts, so far as butter and milk are concerned, is larger than that of Somerset House?—So far as the actual examination of samples is concerned, yes.

1631. And of course the public analysts have their general practice, in addition to the work that comes to them in their official capacity?—Certainly.

1632. They are analytical chemists with a private practice, many of them, I presume?—Yes.

1633. There is going on, I understand, between public analysts, an interchange of ideas, and experiences, and opinions, in connection with analytical science?—No doubt.

1634. And, therefore, would it be fair to assume that they act upon their collective experience, and not upon their individual experience, or, to put it in another way, that the best information that the best of them may procure is placed at the disposal of other analysts throughout the country?—That is so, to a large extent.

1635. And I think it is on record that some of these public analysts have made wonderful researches into, for example, milk samples. I think Dr. Vieth has placed on record his analysis of over 120,000 samples of milk?—But then Dr. Vieth's experiments, so far as numbers are concerned, are of little value, because he was analyst to the Aylesbury Dairy Company, and therefore, the examination of those samples of milk was really done to check the quality of the milk supply of the farmers to the company.

1636. Do you suggest that in consequence of his official connection with the Aylesbury Dairy Company, those analyses were not an honest record?—No, I do not assume that for a moment; but what I mean to say is, that there is a contract entered into by all those dairy companies as to what quantity of solids not fat milk shall contain, and what quantity of fat, and it is the analysts' duty to see that the milk that they get comes up to their standard quality.

1637. But the fact remains that he analysed those 120,000 samples of milk?—So far as the solids not fat and fat were concerned. Of course, in the analysis of a sample of milk, as a rule, an analyst would go more fully into the composition of that sample than is necessary for a commercial purpose of that kind.

1638. I suppose from time to time, certainly since the passing of the Act, there has been a great improvement in the science of food analysis?—No doubt.

1639. And the public analysts have contributed very largely to this improvement?—Certainly.

1640. Somerset House, I presume, gets the benefit of that improved knowledge acquired by the public analysts, and avails itself of the information?—Yes; but, of course, in our investigation of food analyses we always try as much as possible to prove for ourselves, by direct experiments, the value of the results obtained and of the different methods of analysis.

1641. That means, naturally, that you do not necessarily accept in all cases the deductions, or improved results that the analysts announce as having been arrived at?—Exactly.

1642. But in the case of Somerset House arriving at any improved result, or differing in their own minds from some new result, does Somerset House feel it incumbent upon itself to put itself into communication with the public analyst, either to say: Here we have discovered a new method that ought to be known throughout the country, or, We have subjected this new method of yours to close investigation in our laboratory, and we do not agree with the results which you inform us you have arrived at?—We do not make it a general practice, but some public analysts are in direct communication with us, and, of course, we interchange ideas and opinions about different methods of analysis.

1643. May I say then that there is a close intercommunication continously being carried on between the public analysts of the country and Somerset House?—With some of the public analysts.

1644. But not with the Society of Public Analysts in its corporate capacity?—No, I can give you a simple illustration of our position. When poivrette was being used largely in the adulteration of pepper, one public analyst had a difficulty in separating it so as to show it to the magistrate, and I had the pleasure of showing him simply how it could be done, and from that time forward the adulteration of pepper with poivrette has ceased completely.

1645. Because the public analyst received this information from you?—Not exactly, but he not only could say from his analytical results that poivrette was there, but he could show the magistrate its presence.

1646. Showing the enormous advantage to the country from that revelation by Somerset House?—Certainly.

1647. And, I suppose, that Somerset House deems it necessary that there should be this interchange of opinion between it and the public analysts?—It is very desirable.

1648. And may I understand that it is being carried on on a systematic basis, or is it merely casual?—It is on a systematic basis with some members of the Society of Public Analysts.

1649. With those of the most repute, so far as regards reputation?—Yes, with men of repute.

1650. And those men are in close communication with Somerset House?—Yes.

1651. Interchanging ideas, and receiving suggestions from you, and conveying suggestions to you?—Yes.

1652. Have you ever conveyed to the public analysts the details of the methods used by you, or of any standards or limits that you use?—As soon as we made an investigation into the composition of food products, we published the result of the investigation in two little manuals; we made them general property.

1653. Such as Dr. Bell's little work?—Yes.

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1654. But they are published at very long intervals, are they not; you have no journal to convey information such as the public analysts have?—No.

1655. And of those manuals that you refer to, I think, Dr. Bell's little work was published 10 or 11 years ago?—I daresay it was.

1656. When was the other manual that you refer to published?—Two or three years after.

1657. How many years is it since you issued a manual, do you think, from which the public analysts might gain the advantage of your improved experience?—The years I cannot tell you, but you will see it from the title-page.

1658. But there is no systematic publication to which the public analysts can look for inspirations from Somerset House?—There is not.

1659. I think I understood you to say last time that you considered that possibly public analysts might resent it as dictation were Somerset House to communicate their standards authoritatively to them? Yes.

1660. What makes you form that opinion?—I think it is fairly apparent that there is a difficulty in that way from what we see published; for instance, there was an analyst who came to us some years ago who wanted to find out the presence of apples in plum jam. We went into all the trouble and difficulty of showing the method of detection, but a short time afterwards we found that there was a paper written on that very subject, but no reference at all was made to us in any way whatever.

1661. They appropriated your information, and did not give you an advertisement for it?—We did not want an advertisement.

1662. They did not give you the credit of it?—No.

1663. I suppose Somerset House considered that that was not acting quite fairly?—There are other matters as well as these; there are other difficulties arising that are very palpable.

1664. With regard to the standards that you may have at Somerset House, the information as to those has been disclosed, I believe, during the hearing of cases in which Somerset House has given evidence?—Yes, the limits.

1665. That is the way in which that information has become public, as a rule: you told us that you had lately altered your standard of milk?—We have altered the limit of fat from 2·5 to 2·75.

1666. Would that be a matter that the public analysts would be acquainted with, or, rather, informed about?—We stated that distinctly to the different analysts who came up to see us on the subject. We have not written officially to the Society of Public Analysts.

1667. With regard to your system of analysing milk, I understand that you have been in the habit of making allowances for decomposition, time allowances?—We are compelled to make allowance for change, because in the samples of milk that you are speaking of they are old milks, not new milks.

1668. They would naturally be old milks before they arrive at Somerset House?—They must be.

1669. And in order to allow for decomposition

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that has taken place you have a method of calculation?—We see what the change consists of, and work it back again into solids not fat.

1670. Would the public analyst know that table of allowances?—It does not affect them in any way, because they examine the samples of milk when they are fresh.

1671. Do you think that the table of allowances, the time allowances, that you have set forth for your own use, would give the same analytical results when you were dealing with the sample, as were apparent to the public analysts when they were examining the sample in a fresh condition?—Generally, but in special circumstances they would not; and, therefore, we have abandoned the time allowance, and we try to trace up the change in the composition of the sample, and work it back again into solids not fat.

1672. I understand that you have rather altered your time allowances in that direction for the last year or two?—I do not think we have; practically, they are the same.

1673. When these milks come to you in a stale condition, are you obliged to state whether the article analysed is stale; because under the Act the public analysts have to state on their certificate whether the sample is stale, or has been kept too long?—We examine whether it is fit for analysis, or whether there is any change in the composition of the sample that prevents an analysis being made. That is what I think the analysts have to state.

1674. Do you state that on your certificate?—We do not state it on our certificate, but if we receive a sample of milk and find that it has been improperly kept, so that it is mouldy or decayed, we do not examine it. We say that it is not in a fit condition for examination.

1675. In how many cases, can you give us an idea, in recent years have you been unable to examine such a sample?—I should think, in five or six cases.

1676. Does milk becoming decomposed alter its component parts, so far as solids are concerned?—Yes, the solids not fat are altered; the fat remains practically the same.

1677. And it is by this principle of adjustment that you are able to arrive at the correct analysis?—Yes.

1678. May not some of these milks fail to give the same results?—They will not give the same results. If you take two samples of reference milk, the results obtained will not be exactly the same, because they have been kept under different conditions; but we take out the different substances that have been formed, and work them back again into solids not fat, so that if there is a quantity of alcohol formed in the one, and in the other there is none, the alcohol would be worked back again into solids not fat.

1679. Are you aware as to the conditions under which the samples have been kept before they were submitted to you?—We can generally tell from the analysis of the samples under what conditions they have been kept.

1680. But when fermentation takes place, is there not a loss of substance incurred?—Yes; but there is a great loss of substance required to produce a certain quantity of alcohol, and when

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you have that quantity of acohol you put it back again into the term of the substance that has been used up in the production of it.

1681. So that you can account by your system for loss of substance caused by fermentation?—We have found it to be so.

1682. You do not think that any of the conclusions which you arrive at by that process would be such as would cause you to give a decision contrary to that arrived at by public analysts?—Practically, if the former analyses have been correctly made, they would agree with ours.

1683. And there is no chance, you think, of any injustice being done to a public analyst by reason of this system which you adopt in dealing with milks that must necessarily be stale, many of which are in a state of fermentation before you examine them?—I consider that there is no risk of injustice.

1684. Do you ever test these milks for the presence of preservatives?—Yes.

1685. Would a milk bearing preservatives show a different result from a milk that was not preserved?—Yes, you would have changes; one would have decomposed more than the other.

1686. And when you detect preservatives, do you adopt a different procedure in coming to your final decision?—No; we take the results of the analyses, the quantity of alcohol formed, of ammonia compounds, of acetic acid, and so on, and turn these back again into solids not fat.

1687. I refer to the time allowance?—I stated distinctly just now that we had abandoned the time allowance, because we find that in certain conditions the present system is better.

1688. I did not catch that; how long has that time allowance been abandoned, quite recently?—For the last two or three years, but practically they are the same.

1689. What are the same?—The two systems; if you take the time allowance, and take our present method of examination; only no doubt our present system is the better system from a chemical point of view, because we take the determination of the different substances in the milk, and the changes that have taken place, and work them back again into solids not fat, so that it does not depend upon a time allowance.

1690. But in this communication which was referred to by Sir Charles Cameron, from the public analyists to Somerset House, was there not strong exception taken to that system of time allowance, to the system that you had?—I cannot tell all the details that were touched upon in that statement.

1691. I think the public analysts pointed out that they had no knowledge of what your time allowance was, and consequently they were not able to follow the results which you arrived at?—The time allowance, I think, was stated distinctly in Dr. Bell's book.

1692. Can you tell us what is the method that you adopt now since you abandoned this time allowance, as you term it, so that the Committee may understand how it is that you proceed in the case of stale samples?—Yes, the two substances that would change by keeping are the sugar and the caseine. The sugar might be converted into lactic acid, in which there is no change in the percentage of solids not fat; or a portion of it might be converted into alcohol, a portion of the alcohol might be converted into acetic acid. As regards the curdy matter or caseine, a small quantity of that might be converted into ammonia compounds. We accordingly estimate the amount of ammonia; we estimate the amount of acetic acid or any other acid that may be present; we estimate the amount of alcohol, and then, taking those different estimations, we turn them back again into the amount of solids not fat.

1693. In preparing your certificate when you are called in as a court of appeal, as it were, do you certify whether or not any change has taken place in the nature of the article which might tend to interfere with the analysis?—If we consider that any change has taken place in the composition of the article which interferes with its analysis, we should not examine it.

1694. That would come under those samples which you refuse to analyse?—Yes.

1695. Under the Sale of Food and Drugs Act, are you asked for an opinion or to pronounce a judgment on the samples referred to you?—The reference to us under the Sale of Food and Drugs Act is the charge that is made before the magistrate; we have to examine the sample to see whether that charge has been properly made or not.

1696. Do you give a judgment on the charge, as it were, or do you simply express an opinion on the analysis?—We have to certify that in our opinion the analysis gives certain results.

1697. I think you are frequently in the habit of using on your certificates these words as regards milk: "We are unable to affirm that water has been added"?—We have not used that form for years.

1698. I presume that the magistrate on seeing those words would rather feel inclined to think that there was disagreement between the public analyst and Somerset House?—That really would be a misunderstanding, because the expression, "unable to affirm," is only that you cannot tell from an examination of the sample whether water has been added or not.

1699. On your certificate do you give such information as will enable a magistrate to know whether the public analyst's certificate and yours are at variance on a matter of opinion, or on a matter of fact?—On a matter of fact.

1700. I see that you say that your Department have had referred to them since the beginning of the working of the Act 411 samples of milk, and that in 311 of these cases you confirmed the public analyst, and in 96 you disagreed; 311 and 96 cases, total 407; consequently there were four samples of milk in regard to which you neither disagreed with nor confirmed the analyst?—I think there must be some omission there, or some error. I think there is nothing either one way or the other to lead us to come to the conclusion that we did not either agree or disagree with the analyst. I think there is some error in the figures, or that the samples were special ones, as before explained.

1701. Now, on the question of poor milks that have been proved to be pure milks, in your opinion, ought everything that passes from the cow

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cow to be defined as being pure milk?—It is not a matter of opinion with me; it is the interpretation of the law.

1702. And you interpret the Act in that way?—Exactly.

1703. That it leaves you no option but to declare everything pure to which nothing has been added, and from which nothing has been abstracted?—That is the wording of the Act, and we are bound by that.

1704. Can you point out in the Act where that wording is referred to; I have looked it through carefully, and I cannot quite follow it?—The interpretation is from Section 6: "No person shall sell to the prejudice of the purchaser any article of food or any drug which is not of the nature, substance, and quality of the article demanded by such purchaser, under a penalty not exceeding 20*l.*, provided that an offence shall not be deemed to be committed;" and so on.

1705. You adopt a process of analysis different, I think, from that adopted by some analysts?—We do.

1706. And I think you said that when any magistrate has an analysis before him it is necessary that he should consider the method by which the results have been arrived at?—It is desirable that that should be done.

1707. Has he any opportunity of ascertaining this important difference of process?—It is more a matter of opinion than anything else. I have stated the method because I was asked a question about it; but there is no doubt about it that, if we are coming to a small admixture of water, it is necessary that the method of analysis should be known.

1708. But you do not, as a matter of fact, state on your certificates the process which you follow?—No; the process that we follow is one that is well known, and gives the solids not fat and fat; and the process followed generally by public analysts is the one that gives the fat, and the solids not fat are the difference between the fat and the total solids.

1709. You referred to a paper read by Mr. Hehner before the Society of Public Analysts?—Yes.

1710. I understood you to say in reply to a question which I addressed to you at No. 596, in reference to fats and solids not fat, that Mr. Hehner stated that he made no mention of an increase in the fat?—Yes.

1711. Is that the case?—The paper that Mr. Hehner referred to is one in the "Analyst" of 1882, at page 64, I think.

1712. Your statement was that they diminished the solids not fat from 9·0 to 8·5?—Yes.

1713. But that they still maintained the fats at 2·5?—Yes at 2·5.

1714. Does not Mr. Hehner state in that very paper that, whilst diminishing the solids not fat, they transfer that half point diminished to solids that are fat?—You have the book before you; will you kindly tell me where that appears.

1715. It is at page 64: "The figures of the few simple experiments recorded above place beyond doubt that apparently slight deviations from the commonly adopted procedure of milk examination lead to widely discrepant results, and in every instance do the modifications in the

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methods of analysis which I have examined tend to yield a lower amount of solids not fat, and a larger percentage of fat, than does the original (Wanklyn) method"?—The point which I raised was this, that there was no increase by the public analysts in the percentage of fat from 2·5 to 3·0 as suggested.

1716. I understood you to say that there was no increase of fat absolutely suggested?—No; but there is another point to be considered in that paper. The method of analysis that has been spoken to by Mr. Hehner is a different method from the Wanklyn method; it is one where you bring in the Soxhlet Extractor, and that is well known to have a tendency to increase the amount of weight of that substance that is weighed as fat; but there is very little doubt that there is something there besides fat.

1717. As regards those methods of analysis that are adopted you use the maceration method?—Yes we do.

1718. And I think I understood you to say, reading your evidence, that you consider that that is the most suitable method to be adopted?—We say that that is the most reliable method.

1719. But the public analysts do not use it, I understand?—They do not.

1720. They go in for the coil method?—Yes, they go in for the coil method; they use it in reference to samples of milk.

1721. You mentioned that in America Babcock's method was the chief one used, but that is chiefly the coil method, is it not?—Yes.

1722. Only substituting asbestos for paper?—Yes.

1723. On this question of your construction of the Act, bearing on the point of poor milk being accepted as being pure milk, if a vendor of milk supplied what is termed fore milk (strippings it is sometimes called), which is almost free from cream, would you not consider that the purchaser would be prejudiced in such a case?—I think he would be.

1724. Would not the Act apply then?—I think that is for the magistrate to determine, whether the Act applies or not. Personally, if I were buying that milk I should think I was prejudiced.

1725. Can you tell us whether that opinion has been held in courts of law?—I cannot tell you.

1726. I think there have been cases where a vendor has been selling milk from a churn, where one purchaser has come to buy, who has received practically the cream at the top through carelessness on the part of the vendor, and another purchaser has come, and has received what is practically skim milk; and I believe the courts have held that the purchaser has been prejudiced in the latter case?—Yes, I should say that the court would settle it in that way.

1727. But still at Somerset House you maintain the opinion that notwithstanding that the milk is very poor, provided that it comes from the cow, it is a legal tender, if I may so use the word, it is saleable as a pure article?—I think it is scarcely right to say that we hold that opinion at Somerset House. I would rather put it in this way, that the interpretation of the law seems to be in that direction; but so far as we

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Mr. *Kearley*—continued.

at Somerset House are concerned, the only matter that we have to settle is to examine the sample of milk that comes before us.

1728. I do not wish to put it in that way. You have altered your standard recently, have you not?—We have altered the limit from 2·5 to 2·75.

1729. What was your standard before you altered it?—2·5 was the limit.

Mr. *Kilbride.*

1730. What is it now?—2·75 per cent. of fat.

Mr. *Kearley.*

1731. And 8·5 of solids not fat?—Yes.

1732. The majority of milks of commerce would not be from single cows, I understand; they would be from herds?—Quite so.

1733. Consequently the possibility of a poor quality of milk existing in dairy milk is reduced very much?—It is.

1734. On the question of standard, was it the fear of condemning a milk that was pure, that has induced Somerset House to keep their standard fairly low. I believe it is somewhat low as compared with what is adopted in other countries, and also by the Society of Public Analysts?—No; I think the whole subject depends entirely upon the Act of Parliament. In other countries you will find that the Act of Parliament is different, and therefore they can go on a different line.

1735. Do I rightly understand you to suggest that the Act of Parliament defines the standard?—No, I do not; but the information that was obtained by the Committee on whose Report the Act of Parliament was founded laid it down distinctly that all these little differences that you find in the feeding and keeping of cows, their housing, different seasons, and all that, had to be taken into consideration.

1736. Then your standard is practically intended to represent a fair average analysis of milks obtained from herds, not from individual cows; because the milk of commerce is admitted, I believe, to be the milk of herds, milk in bulk?—Yes; but the difficulty of interpreting the Act of Parliament in that way arises from this fact, that it applies to England, Scotland, and Ireland; and there is no doubt that so far as the large towns are concerned that is the fact; but there is a large quantity of single cow milk distributed in country places, and, therefore, if we had that definition it would follow as a matter of course that a person in a country place might be convicted when he was selling genuine milk.

1737. As a matter of fact, then, you fixed your border line so as not to exclude single cow milk that might be poor?—But there are a great many single cows that come far below 8·5.

1738. In solids not fat?—Yes.

1739. What about the fats too?—Some of the fats are lower.

1740. Lower than 2·75?—Yes, considerably.

1741. Would you condemn those milks?—No, I should not. If I knew the origin of the milks I should not condemn them; it is simply because we do not know the origin of the milk that we are compelled to put in the limit.

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1742. Has the Society of Public Analysts the same standard as Somerset House, within your knowledge?—My opinion, from what I know from public analysts who have consulted us, and from the result of examination, is that the standard of the Society of Public Analysts seems to be 8·5 of solids not fat, and 2·5 of fat.

1743. Not three?—Not three.

1744. I am afraid that the Society of Public Analysts would rather not accept that statement, because, as I understand, and am advised, their figures are 8·5 of solids not fat, and 3 per cent. of fat?—I have not seen any authority for the 3 per cent. of fat.

Mr. *Kilbride.*

1745. You have authority for 2·5 per cent.?—Yes; public analysts at starting made their standard 2·5 of fat.

Mr. *Kearley.*

1746. Do not you think it would be better if Somerset House and the public analysts could come to some common agreement as to the standard on which they could proceed to make analyses?—Really, so far as the public analysts and Somerset House are concerned, the very few variations that there are between Somerset House and the public analysts show conclusively that the method of analysis now pursued is a very good method.

1747. Practically agreeing?—Yes; the public analysts, like ourselves, have got greater experience of natural products, and have used that experience, and methods of analysis have been devised for the purpose of coming to correct conclusions from the samples that are submitted to them.

1748. Do you remember a case that occurred before the Derby Borough Bench, in which your certificate was brought into question; it was in October, I do not know in what year, but quite recently, I think, in which a certificate on a sample of milk was given which showed less than 8·5 per cent. of solids not fat, and you furnished the magistrate with a certificate on a sample of milk one month old, or rather less, which the analyst reported to be watered, and which you found to contain 7·89 per cent. of solids not fat more than it ought?—I cannot keep those figures in my mind. If you had given me notice I would have brought our book of analysis, in which it is recorded, and then I could have referred to it.

1749. Perhaps you will refer to it at a later period?—Yes, I will.

Derby Milk Case: Sample received at Somerset House, 8th October 1881; purchased 18th September; public analyst certified to 10 per cent. added water.

Somerset House Report.—"We hereby certify that we analysed the milk and declare the results of our analysis to be as follows:—

Solids not fat	=	7·89 per cent.
Fat	=	3·68 „
Water	=	88·43 „
Ash	=	0·74 „

"After making the addition for natural loss arising from the decomposition of the milk through

Mr. *Kearley*—continued.

through keeping, the amount of 'solids not fat' is not lower than is found in genuine milk. The percentages of fat and ash are each equal to that found in genuine milk of good quality. From a consideration of these results, and the particulars supplied, we are not prepared to affirm that water has been added to the milk." The particulars referred to relate to the food of the herd, which consisted principally of grass, with a few "grains," &c.

From the "Analyst," 1882, page 5, it appears that the public analyst found:—

Specific gravity-	=	1027·4.	
Solids not fat -	=	8·37	per cent.
Fat - - -	=	3·49	„
Total solids -	=	11·86	„
Ash - - -	=	0·65	„

"The duplicate analysis gave total solids 11·97, and ash 0·66 per cent." It will be observed that the duplicate total solids are 0·11 per cent. above the figures on which the analyst appears to have certified 10 per cent. of added water, and that 9·3 per cent. of "solids not fat" must have been the limit employed in estimating the added water. Had 8·5 per cent. been taken as the limit, the amount of added water shown would have been 1½ per cent., and if the amount of the duplicate total solids (11·97 per cent.) was used in the calculation, it would show no added water. It is proper to add that the method probably employed by the public analyst in the above case has now been abandoned.

1750. With regard to fixing a standard, you are adverse to a hard-and-fast standard being fixed?—I am.

1751. An honourable Member, who is now away, asked you a question as to whether in the case of a fixed standard all the richer milks would not be watered down to that standard; but surely that would apply now, because, although there is not a standard fixed by Act of Parliament, there is the standard that Somerset House uses, which is well known; and, consequently, if a man wished to adulterate, he would water down to that point?—But there may be means of knowing where that man gets his milk from, and, certainly, if a sample of milk came before me, and I found that it contained even as high as 8·8 per cent. of solids not fat, and 3 or 4 per cent. of fat, if I knew, for certain, the origin of the milk, and it had been watered, I should certainly return it as adulterated.

1752. Has there been any expression of opinion on the part of large dairy companies, do you happen to know, as to the desirability of fixing a standard?—I do not know that there has been.

1753. I understand that they were adverse to it in the early days of the Act, but that now they have expressed an opinion in favour of a standard being set up. Perhaps you do not know that?—No.

1754. As regards butter, have you a standard for butter?—No.

1755. I understand that after you have made your analysis, that is to say, after you have ascertained the portion of soluble and insoluble fatty acids, then from the physical conditions of the sample you determine whether the sample is genuine or not. Can you explain to the Committee precisely what you mean by that. What are the physical conditions to which you refer, and what limits do you allow for moisture with regard to the soluble and insoluble fatty acids?—The butter when it comes to us is one that has been kept a little while. We have to take into consideration as to whether it is rancid or not, whether it is mouldy or not, and other physical appearances and indications connected with the examination of the sample, before we can come to a distinct conclusion as to whether foreign fat is present or not, unless it is a special case, an extreme case.

1756. You stated that there is very great difficulty in the analysis of butter, because by keeping the per-centages are changed?—That is so.

1757. So that it must follow that if you get a fresh butter to which margarine, in certain limits, has been added, the result will be the same as the examination of old butter that is genuine?—Yes.

1758. But the public analyst receives the sample as soon as it is purchased?—I think this will throw light upon the examination of butter; if you will allow me to read a quotation from the July number of the "Analyst," which has just come out. On page 154 this statement is made in connection with the Valenta Acetic Test for foreign fat, by Mr. Hehner: "He had experimented a good deal with the Valenta, and once thought highly of it; but on fuller experience he had been disappointed, as was the case with all other methods of fat analysis"; and further down, on the same page, Mr. Hehner said: "It seemed to him that these small mixtures, up to about 15 or 20 per cent., were as undetectable by the Valenta as by any other process."

1759. Of course the analyst would have to state on his certificate whether the butter, as in the case of milk, had undergone any change that might interfere with the analysis?—Yes.

1760. And he would be in a preferable position for correct analysis, dealing, as he would deal, with perfectly fresh butter?—He would have the butter in a physical condition that would certainly be better than when we got it further on, if it had not been kept properly.

1761. Do you adopt the same process in dealing with butters as you do with milk; do you have to consider the possible result of the butter being made from the milk of a cow giving poor milk?—I am very glad that you have asked me that question, because the butter, as it is now put on the market, is really the joint production of many cows. There is no doubt that, both in this country and abroad, the co-operative dairying, the collection of butter from different sources, and subsequent remaking, is largely on the increase; so that now you very seldom find butter sold which has been made from one individual cow.

1762. Do you think that that system gives better results?—It tends to give more uniform results. There is great difficulty at the present time in getting ordinary commercial butter that would

Mr. *Kearley*—continued.

would contain the same quantity of soluble fatty acids as some of the butter obtained 10 or 15 years ago, because now there is no doubt that persons who have cows, in country places particularly, sell the milk instead of making butter, so that we have to depend on large dairies, co-operative farms and the like, for our supply of butter; and therefore we shall have it more uniform in chemical composition than we used to do.

1763. Do you think that the average quality of that milk is lower or higher than of the milk that used to be employed in making butter on the small dairy process?—There is no doubt that if you get a cow or cows that are well fed and give good milk, the butter obtained from that milk will often be rich in soluble fatty acids, and comparatively low in insoluble fatty acids; and when you get a sample of butter from the market at the present time we find that the soluble fatty acids are lower and the insoluble fatty acids higher than in that particular case to which I refer.

1764. With regard to the question of the limit of water in butter, you suggest that 16 per cent. is a fair maximum?—Yes; I should like, if I could, that that should refer to tub butter, salt butter.

1765. That will be the maximum of all butters?—As regards fresh butter, take the case of New Zealand, where the limit is 8·88. A man could work in 8 per cent. of water there, and although it would be under 16 per cent., it would be adulterated, and he ought to be punished.

1766. But under the magistrates' decision he is at liberty to go to 20 per cent. of water?—Yes.

1767. So that if the limitation were fixed at 16 per cent. there would be a clear gain of 4 per cent. on the present basis?—Yes; but it is right for me to tell the Committee, I think, that on Saturday I got a report from Ireland to the effect that the Cork authorities are prosecuting the farmers now around Cork for supplying butter to the Cork market containing 20 per cent. of water, and they have got convictions in all the cases. The Cork authorities have come to the conclusion that it is very necessary that this form of adulteration should be put down, because the Cork butter is being driven out of the market.

1768. But, speaking from memory, was not the defence at Manchester that these particular Irish butters could never be expected to bear less than 20 per cent. of water?—That was the statement made.

1769. By those interested in Irish butter and its character?—Yes; from the farmers.

1770. The strong evidence given before the magistrates at Manchester on the part of Irishmen interested in butter was that it was perfectly consistent with the butter being legitimate that it should contain 20 per cent. of water?—There is no necessity for it to contain 20 per cent. of water.

1771. But that was their point?—Yes.

1772. So now, from information which you have received, they are rather shifting their ground, and taking up another attitude?—I think it is necessary.

Mr. *Kearley*—continued.

1773. So do I?—If this is relevant to my former statement, I may say that I was talking to a large butter importer in Manchester, who drew large supplies from Ireland, on this question of the large excess of water in Irish butter; I said that I felt quite sure that it would have the effect of deterring people from buying Irish butter; that they will get it from other sources. I saw him sometime afterwards, and he said that I was perfectly right, that he was getting tub butters from Denmark; that his customers would not look at Irish butter, because it contained such a large quantity of water.

1774. Would you agree with fixing a standard of the per-centage of water in order to keep the trade in the United Kingdom?—I think that that could be done without fixing a standard.

1775. By the trustees of the Cork market, and such people?—Yes; I think the market itself will settle the standard.

1776. I have had brought to my notice a certificate given by Dr. Bell in his book, where he included under the head of genuine butter a sample containing as much as 20·75 per cent. of water?—That is a very long time ago, and that was a private sample.

1777. You would not pass a sample now with 20 per cent. of water?—Not without making a remark about it.

1778. You would not pass it as genuine, would you?—No.

1779. The Minister of Agriculture asked you the other day whether you had ever heard of an article called lactine or cocoa butter, or lardine, and as to whether those articles were inferior kinds of margarine. Do you consider that those articles enter into the composition of margarine at all?—I do not know.

1780. Is not this lactine refined cocoa-nut oil?—It is.

1781. And it is used, I understand, as a cooking fat chiefly for export purposes?—Yes; it does not answer very well for cooking fat; it is so objectionable in flavour.

1782. And lardine is a lard substitute?—Yes.

1783. And not in any way whatever sold as a low character of margarine?—It is not.

1784. With regard to vinegar, you stated in reply to a question by Sir Charles Cameron, the details of a case of vinegar adulteration?—Yes.

1785. In that case the maker who supplied a number of shopkeepers at Sheffield with adulterated vinegar, of whom eight had previously been apprised of it, had at last been traced by the authority, and the analysis of the Public Analyst showed that the sample contained 20 per cent. of real malt vinegar, and 80 per cent. of diluted acetic acid not made from malt. Did you know that when the sample was referred to you?—It was stated on the certificate.

1786. A sample was referred to Somerset House, with the assent of the magistrates, of course?—Yes.

1787. Did you take no other steps to ascertain the composition of that vinegar?—Not at that time.

1788. But had you had independent investigations made on the part of Somerset House in the district?—We made inquiry through our own collector about the method of manufacture of the vinegar, and what was done by this particular manufacturer.

Mr. *Kearley*—continued.

1789. When this case was referred to you, you did not simply answer the question at issue, whether or not the vinegar contained only 20 per cent. of malt vinegar; your certificate, as I read it, gave no direct answer to that question, but stated, after giving the result of the analysis, "We are of opinion that this vinegar has been prepared by mixing products derived from the fermentation of malt and sugar with acetic acid, obtained by the destructive distillation of wood. From a consideration of the analytical results, we are of opinion that the acetic acid derived from wood does not exceed a fourth of that present in the vinegar"; do not you think that that certificate would rather have a tendency to induce the magistrates to dismiss the case?—It might; but after examining the sample, I was surprised that any person should say that it contained 80 per cent. of acetic acid and water.

1790–1. Then your certificate was really at variance with that of the public analyst?—To that extent. There was no indication of 80 per cent. of acetic acid and water.

1792. Is there any test for wood acid?—None.

1793. In your certificate did you condemn the vinegar?—No, we reported exactly as you read; I expect that is a copy of our certificate.

1794. It is; you did not condemn the vinegar, but reported that it was not a sample of malt vinegar?—No, it was referred to us as malt vinegar; then other remarks were made in reference, and what we said was for the purpose of clearing up the reference.

1795. On the question of malt vinegar, do you agree that when malt vinegar is asked for, it should be vinegar distilled from malt?—No.

1796. Made from malt?—Made from malt and grain; made from malt or malt and grain.

1797. But you would not give any further latitude in the making of vinegar; or rather, when malt vinegar is demanded, you would consider that it should be made of malt, or malt and grain?—I should liberally read the expression "from grain," because in some cases it has been said that the word "grain" refers to barley. If a man used other grain, or other starchy matter, I should consider that that brewed with malt was malt vinegar.

1798. Many suggestions have been made, I believe, on the part of the Society of Public Analysts, that there should be a central department having the power relegated to them that Somerset House now enjoys, consisting of six, or more, or less perhaps, gentlemen of scientific standing, including three public analysts who should work out methods of analysis and lay down limits and standards; do you agree with that suggestion?—I do not.

1799. I think you raised the point that the commercial interest should be represented?—Certainly. As soon as that paper was read, the very first suggestion made by a chemist and druggist present was that there should be two pharmaceutical chemists put on; you can easily see, therefore, that if you have a central board of that kind, you must have the trades represented. But I think you want more a central laboratory to do the work than such a court of reference.

1800. Would you have it a Government Department?—There would be a great deal of work to be done in a central laboratory of that kind, if it were to be organised as you state.

1801. I may say that as regards the trading community of London, at all events as represented by the Chamber of Commerce, they have given their approval to some such scheme. They feel that it would be advantageous to have a more representative body in closer touch with public opinion than Somerset House?—As a member of the Chamber of Commerce I saw what was done at the Chamber, and I thought it necessary to have some enlightenment on the other side as well. There was one side very well represented, but not the other.

1802. You do not think that it was an acceptable expression of opinion; you think it might be subject to reversal if the point were raised again?—I think so.

Mr. *Colman.*

1803. You referred, I think, to the laws on adulteration in other countries?—Yes.

1804. Have you in your office any details of the Acts as to other countries?—I have got the details of an Act of Parliament about the manufacture of oleo-margarine in America. I have also written to the French authorities and the Austrian authorities for the purpose of getting fresh information, and I am promised it. But I am told that it will take me something like six weeks or two months to get it; but I shall be happy as soon as I get it to place it at the disposal of the Committee.

1805. Then, perhaps, when you do get it you will communicate with the Committee, if they are sitting?—Yes, with pleasure.

1806. Do I rightly understand that that relates to adulteration, or simply to margarine?—To adulteration generally and to margarine; the manufacture of it, and the selling of it.

1807. But I thought that one of your answers referred to the law as to adulteration in other countries being somewhat different from ours?—I think there is some misunderstanding. I referred particularly to milk in that connection.

1808. On the question of cases that come before you for analysis having been before the magistrates, do you get, when the samples come to you, the analysis which has been put before the magistrates?—No, we do not. The charge is put before us in the report from the clerk to the magistrates, but not the figures.

1809. Then in what way do you find that you differ from the public analyst?—That is when the case is heard before the magistrate afterwards and reported in the papers.

1810. A report is sent to you?—A report is sent to us by the clerk to the magistrates, with the sample, and stating what the allegation of adulteration is. We examine the sample, and then we send our report to the clerk to the magistrates, or to the gentleman who corresponds with us; and then, generally, we hear nothing more of it until we pick up the information in the newspapers, from the report of the case when it is finally heard before the magistrate.

1811. There is no other return to you as to the result before the magistrate?—None.

1812. Do you think it would be desirable that there

Mr. *Colman*—continued.

there should be such a return made to you?—I think it would be desirable.

1813. On the question of milk we have had some very strong opinions expressed, either by yourself or by another witness, as to the unnutritious quality, if I may put it so, of skim milk?—But that is not so; skim milk is very nutritious.

1814. You think it is nutritious?—Certainly.

1815. I think we have had from some witness an expression of opinion as to the want of nutrition in skim milk, and I want to call attention to the fact that the Committee which sat in 1874 expressed the opinion that skim milk is a nutritious and valuable article of food. That Committee was of opinion that the sale of skim milk for new milk should decidedly be regarded as a punishable offence, but that skim milk itself is a perfectly wholesome article. In that you would agree?—Certainly.

1816. Have you anything to say as to what we call separated milk as distinct from skim milk?—I think that separated milk is better than skim milk. It will not contain so much fat, and that is the objection to it, but it is a fresh milk, and skim milk is not. Skim milk is just on the point of souring, and that being so, it follows as a matter of course that it is not suitable for infants, the separated milk can be used for domestic purposes for feeding children, and it is quite suitable for feeding children when you can give them a little more fat from some other source than what skim or separated milk possesses.

Mr. *Whiteley.*

1817. You would say that it is a good thing for bone and tissue?—Yes, that is just what it is suitable for.

Mr. *Colman.*

1818. Have you any knowledge of the comparative nutrition of separated milk, according to whether it is separated by the ordinary hand machine, or whether it is separated by steam power?—I can give you a little information about the separation by steam power. At the Bath and West of England Agricultural Show in 1888 the fat left in the milk by a separator was 1-11th of 1 per cent., so that it was nearly all taken out.

1819. Have you any knowledge coming before you especially as to the question of colouring milk?—We see it from time to time, nothing more than that.

1820. Is it a common practice?—Quite common in London at certain seasons of the year.

1821. In all parts of the country?—In all parts of the country where such coloured milk is in demand.

1822. On the question of margarine, do you think that it is injurious as an article of food that margarine and butter should be mixed together?—I think it is not injurious.

1823. Your point is simply that it should be sold fairly as a mixture?—At the present time it has to be sold as margarine.

1824. Do you think that that is desirable, or that it should be sold as a mixture?—There is only one point to be said against its being sold as a mixture, and that is that it is very easy of manipulation. It is not like coffee and chicory; it can be done at any moment at the time it is sold; so that it is slightly different from a mixture of coffee and chicory in this respect.

Mr. *Colman*—continued.

1825. I think you said that one of the difficulties as to butter was that you did not like to seize a parcel of butter because it is a perishable article?—On importation, yes.

1826. Would that be met if suspected parcels, being seized, could be released by a bond of value being given by the consignee?—It could be met in that way.

1827. Could something of that kind also be done in the case of milk coming in considerable quantities from farmers?—Yes, but there is a difference in this respect: that one is coming from abroad and the other is produced in this country; and, in the one case, a warranty comes in and in the other case it does not. So that, so far as the farmer is concerned, the consignee could be protected, to a large extent, by the warranty which he gets from the farmer.

1828. But, so far as butter from abroad is concerned, you think that that would be a fair way of meeting that point?—I think it might be met in that way.

1829. Do you recollect anything of a case which occurred in Merthyr, in which your decision was different from that of the analyst, as to vinegar?—Yes. Merthyr Tydfil Vinegar Case: Received 29th August 1893; said to be vinegar containing 80 per cent. dilute pyroligneous acid. Laboratory results:—Specific gravity, 1025·25; acetic acid, 4·52 per cent.; total solids, 4·81 per cent.; ash, 1·032 per cent.; P_2O_5, ·014 per cent.; sugar as dextrose, 1·76 per cent. The laboratory results were reported, and in the certificate it was stated that from a consideration of the results of the analysis, including an examination of the constituents of the ash, and extractive matters, we were of opinion that the vinegar did not contain pyroligneous acid, but that the acetic acid present was derived from the acetification of the alcohol produced by fermentation in the manufacture of the vinegar; and we were further of opinion that the sample corresponded to a commercial vinegar made from malt and grain, and other starch products.

1830. I think that the analyst came to his decision on account of the absence of phosphates from the vinegar?—I cannot remember the whole of the circumstances, so you will excuse me if I speak with caution. I believe that that was the reason why he came to that conclusion.

1831. You referred to malt vinegar, and you said that it had to be made of malt, or malt and grain; but in using the term "malt," do you mean necessarily malt made from barley?—No, it would include any malt.

1832. Malt may be fairly made from any wholesome grain?—Yes.

1833. And that would be included in your term "malt"?—Yes, but as a rule you find that nearly all malt is made from barley.

1834. But you would not necessarily require that it should be made from barley?—Certainly not.

1835. Now, if a public analyst writes to you for a standard for an article, do you give it?—We give him a limit; any information that we can give him on the subject we do give him.

Mr. *Colman*—continued.

1836. That is in the ordinary course of things?—Yes.

1837. Do you think these standards or limits would be well fixed, as has been suggested, by a board of analysts and scientific men?—Personally, I am opposed to standards altogether; I think that we can do a great deal better without them.

1838. If any board of analysts and other scientific people were arranged for helping the working of the Act, do you think that that, irrespective of standards, would be desirable?—I think it would not, unless every class affected was represented, the scientific part and the trading part.

1839. This is the question which I wanted to come to; perhaps the analysts would not assent to that?—I expect they would not; I do not know.

1840. You think that if there is a board the traders should in some way be represented upon it as well as the scientific element?—Certainly.

1841. I do not think we have had it handed in; I do not know whether you could hand in the form which I think the Local Government Board sends out for the qualification for an analyst; have you any knowledge of that yourself?—I have not.

Mr. *Yerburgh.*

1842. I want to ask you on one point with regard to the manufactories of margarine in this country. In reply to Sir Charles Cameron, at Question 903, I think you said that every place where margarine is manufactured in this country is under inspection?—Is licensed.

1843. That is in reply to Question 902; but in the following question, 903, Sir Charles Cameron asked you whether it was under inspection, and you said yes?—What I meant in my reply was not that it was under inspection in the sense of watching the manufacture, but simply that a notification was given about the place, and a license had to be taken out for it; and of course the authorities would see, or would know whether the license had been taken out or not. But so far as the details of the manufacture are concerned, I did not intend that remark to apply to the details of the manufacture carried on in that particular place or factory.

1844. I did not propose to ask you for an illustration of the Margarine Act, but I put that question to you on account of your answer to Sir Charles Cameron. I understand you to say that you do not commit yourself to the opinion that there is a power of inspection of these factories?—I do not.

1845. With regard to your reply to Question 960, upon the working of the Margarine Act, you were asked upon the colouring question, and your answer was that you thought that "there should be a right to colour margarine in the same way as the colouring of butter is allowed"?—Yes.

1846. I think you based that opinion, turning to your reply to Question 964, on the fact that "any registration of that kind must increase the price of the finished article"?—Yes, it would increase the price of the finished article.

1847. But, then, do I correctly understand you

Mr. *Yerburgh*—continued.

to imply that margarine sold under its proper colour, without any colouring matter, would command a higher price in the market than margarine sold coloured?—My remark applied to mixtures both of margarine and of butter that are called margarine under the Act.

1848. But I understand you to say that, if colouring was prohibited, that prohibition would increase the price of the finished article?—It would not increase the price of the finished article as margarine, but what I intended to state was that any prohibition of that kind must have a tendency to increase the price of the butter that was sold; because, of course, margarine not being coloured, could not be used as a substitute for butter as it is now.

1849. Then I understand that your view is, that if you prohibited the colouring of margarine, the effect would be to raise the price of genuine butter, because the margarine would not come into competition with it?—But that remark about margarine applies to mixtures of margarine and butter imported in the name of margarine.

1850. But I understand you to say that if the colouring of margarine were prohibited, the price of butter would be increased?—Yes.

1851. I understand from that, that your objection to the colouring of margarine is that the price of genuine butter would be raised?—To put it in another way, margarine at the present time, as imported into this country, contains a large quantity of butter in many cases, and if we were to prohibit the colouring of that mixture of margarine and butter, it follows, as a matter of course, that it cannot be used as an ordinary substitute for butter to the same extent as it is now, and, consequently, the price of butter must be increased. That is the meaning of that answer.

1852. Therefore, broadly, it comes to this: that if you prohibit the colouring of margarine, the price of butter will increase?—It must do so.

1853. Have you any other objection to the prohibition of the colouring of margarine?—None.

1854. Are you aware of any of the regulations in force in other countries with regard to margarine?—Yes; in some other countries, especially when you come to countries that are very large exporters of butter, the authorities are very particular about the colouring of margarine; but in this country we are just in the other position; we have a very large number of consumers, and not sufficient food for them to eat.

1855. Do you think, then, that abroad they are justified in making such regulations about the colouring of margarine?—Take a country like Denmark; the exports of butter and milk are about the only exports that they have, so that they will do everything they possibly can to increase their butter and milk industry.

1856. Then let us take the case of France; do you know what the feeling in France is?—In France at the present time the feeling is, no doubt, to suppress margarine.

Mr. *Whiteley.*

1857. On the part of whom?—On the part of the Government; simply because there is such a large quantity of butter imported from France.

1858. You

Mr. *Yerburgh.*

1858. You are not aware of any representation having been made on behalf of the makers of margarine, against any proposal to interfere with the colouring of margarine in France?—I am not certain; but I think that the colouring was to be very distinctive, and on this account there was to have been a factory started, I think, at Southampton, simply on account of this colouring; but that was abandoned.

1859. From the point of view of the consumer, upon the question of the colouring of margarine, I take it that the colouring does not add to the wholesomeness of margarine in any way?—But it adds to its appearance.

1860. That is not my question; is it equally wholesome for people to eat?—Yes.

1861. And, apart from improving its appearance, it would be equally good for the consumer, if it were not coloured?—I think he would not enjoy it so much as food.

1862. That is not the point?—But it has a great deal to do with the point. It all depends upon whether you have an appetite when you sit down to your food, whether you enjoy it or not; and in the same way from the appearance of margarine that is not coloured, the person who uses it will not enjoy it so much if it is not coloured, and made pleasing to the eye.

Mr. *Frye.*

1863. You might say the same of butter?—Certainly.

Mr. *Yerburgh.*

1864. You would raise no objection to colouring butter?—It is coloured already.

1865. You would not interfere with that?—No.

Mr. *Kilbride.*

1866. What percentage of grass butter made at this time of the year is coloured?—I should think none; but in winter there is a large quantity coloured.

Mr. *Yerburgh.*

1867. Then I take it that, on the same ground of pleasing the consumer, you would see no objection to a small quantity of butter being added to margarine, apart from the colouring matter?—The margarine imported into this country contains large quantities of butter.

1868. I know it does; but you see no objection to that?—I do not see any.

1869. Therefore you see no objection to margarine being coloured, or to its having butter mixed with it?—So long as it is called margarine, or the purchaser knows that it is a mixture.

1870. I think you are of opinion that these Adulteration Acts ought to be administered very strictly?—Certainly.

Mr. *Yerburgh*—continued.

1871. Would you look at Question 943; you were asked upon this question of the test for foreign fats, and your reply was, "The margin that is allowed you is so wide that the adulterators could take an ordinary butter of good quality and add to that a quantity of foreign fat, and in chemical composition it will correspond with genuine *bonâ fide* butter"?—Yes.

1872. Therefore I would like to ask you whether the practice of which you approve, namely, of mixing butter with foreign fat, and colouring the foreign fat, does not make it more difficult for you to detect adulteration?—Certainly it does, as far as the physical tests are concerned.

1873. Therefore, if you are really anxious to see these Acts strictly carried out, you told the Committee, you would rather be in favour of prohibiting the colouring of margarine and the mixture of butter with it?—Yes, in the abstract.

1874. But when it comes to practice?—We are compelled to take a commercial view of all these questions.

1875. Do not you think you are rather taking the view of the seller of the article, and not of the consumer?—I hope I am not.

1876. Do not you think that it is the interest of the consumer that adulteration should be stopped, if possible?—Certainly.

Mr. *Kilbride.*

1877. Does not the colouration of margarine tend to lead to fraud?—It does.

1878. Does the colouration of butter, in your opinion, lead to fraud?—No.

Mr. *Yerburgh.*

1879. I do not think you have been asked any questions as to whether there was any adulteration of cream. Have any samples of cream been referred to you?—We have had no samples of cream that have been adulterated.

Mr. *Dunbar Barton.*

1880. You are reported in some papers, including "The Grocer," to have said this, when you were asked as to where the butters came from chiefly that were adulterated with foreign fat: "The witness replied that some came from France, and some more generally from Ireland." I take it that it is a mistake to say that you said Ireland?—I did not say Ireland at all. Any remark that I made about Ireland was about water, not adulteration with foreign fat.

1881. Then that is a mistake?—Yes.

1882. You never suggested that there was any adulteration with foreign fats in Irish butters?—I have not seen any at any time.

Friday, 20th July 1894.

MEMBERS PRESENT:

Mr. Bolitho.
Mr. Channing.
Mr. Colman.
Sir Walter Foster.
Mr. Frederick Frye.
Mr. Herbert Gardner.
Mr. Jeffreys.
Mr. Kearley.
Mr. Kennedy.
Mr. Lambert.
Sir Mark Stewart.
Colonel Warde.
Mr. Whiteley.
Mr. Yerburgh.

SIR WALTER FOSTER IN THE CHAIR.

Mr. JAMES LONG; Examined.

Chairman.

1883. YOU were formerly Professor of Dairying at the Royal Agricultural College, Cirencester?—I was.

1884. And you are now a member of the Council and of the Margarine Committee of the Central Chamber of Agriculture?—Yes.

1885. And you are also a member of the Council of the British Dairy Farmers' Association?—Yes.

1886. You are aware that there is a certain report of the Margarine Committee of the Central Chamber of Agriculture which has been prepared not long since?—Yes, I am.

1887. And you advocate the proposals contained in that report?—I do; I have the report here.

1888. I think that there are 12 clauses in that report?—Yes.

1889. And the first clause is that the colouring matter of margarine should be absolutely prohibited?—Yes.

1890. On what ground would you advocate that?—I have taken that point further on in my evidence, if you would not mind with my dealing with it later on.

1891. Will you deal with every one of these points in your evidence as they crop up?—Yes.

1892. Then I think you are in favour of having a laboratory under the Local Government Board?—The proposal that I have to make is that in connection with the Local Government Board there should be a bureau or department dealing with dairy produce together with a laboratory; that is to say, a laboratory in their department.

1893. In substitution of the laboratory at Somerset House, do you mean?—I would propose to transfer the work done at Somerset House to this department, so far as regards dairy produce. My suggestion is derived from the experience of the Americans in their Dairy Commission and in their dairy bureaus.

1894. Do you think that the Local Government Board would be a more appropriate place for that laboratory than the Board of Agriculture?—So far, the Local Government Board have had a great deal to do with questions of this kind. I should not object to the Board of Agriculture at all if it could be arranged to have such a bureau under them.

Chairman—continued.

1895. What I understand you to want is the establishment of a place for official analysis?—For the control of the sale of dairy produce, and for the analysis; and I also suggest that the public should be enabled to send samples to this department at fixed fees, say, for example, 2*s.* 6*d.* for milk.

1896. So as to encourage the public to obtain analyses from time to time of the articles that they consume?—Exactly.

1897-8. In what respect do you think that such an institution or laboratory would have an advantage over the present system?—I think it would be more concentrated. Referring back again to the American plan, they have in New York State, or have had, a Dairy Commission, and in Massachusetts they have a Bureau of Dairying under a commissioner who has a number of inspectors and assistant commissioners, and the business of these men is to regulate the sale of dairy produce, and to control the sale of pure goods. I shall be able to tell you presently, from what I have seen personally in the States, that they have practically driven out the sale of margarine altogether, and have enabled the public to obtain milk of a much higher standard than they ever did before.

1899. What has the effect of that been on the price of those articles?—I could not answer that question off-hand; I do not know the price of the goods in previous years; I cannot tell you that.

1900. You would also advocate some means of getting at the wholesale dealers, I understand?—With regard to that point, I suggest that the retailers should be prosecuted in preference, as some have suggested, to the wholesale man, because you cannot get at the wholesale man unless you get at him through the retail men. My experience

Chairman—continued.

perience is that you ought to reach the man who is supplying probably 100 other retailers with the same material, and that you would not reach him at all unless you got at him through one of his customers.

1901. That is to say, that an adulterated sample having been obtained from the retailer, you would use that sample and the analysis of that sample, as the means of prosecuting the wholesale dealer if the retailer brought forward satisfactory evidence that he obtained the article direct and that it had not been tampered with since?—Yes; but I would go to the retailer first. If he established his innocence to the satisfaction of the court, I would then go to the wholesale man.

1902. That would be a difficult process in many cases, would it not?—I do not think it would if the retailer established to the satisfaction of the court that he obtained those particular articles from a particular firm. If he failed to do so he ought to be convicted, of course.

1903. It would be very difficult for a retailer in a large way of business, would it not, to absolutely identify any such article?—I grant that; it would. That is, of course, his affair.

1904. Then you would have lettering on packages of margarine?—The lettering on packages is already provided for by the existing Margarine Act; but I think that on paper and on smaller packages the lettering should not be less than an inch and a half by an inch.

1905. Then some smaller packages would be entirely covered by the lettering, would they not?—I think it would be all the better if they were. I think also that the lettering should be in black, or dark blue, and that the lettering should be thick; that should be a *sine qua non*.

1906. Then if you came across a consignment of adulterated butter you would confiscate the whole quantity?—I would certainly.

1907. That is to say, if in a retail shop you found a sample of adulterated butter taken from a consignment, say, of two or three hundredweights, you would confiscate the whole of the adulterated butter?—My suggestion is rather with regard to the imported produce, or consignments *en route*. This suggestion was made in the evidence given in 1887 to the Committee on the Margarine Bill of that day by Mr. Lovell, one of the largest men in the trade, who made a strong point of this very question; he thought that if consignments on the way to the retailer, or even to the wholesale man, were confiscated, the Act would have a very great effect in depreciating or discounting fraud.

1908. To go back for a moment to the lettering, what I meant was that in very small packages letters of an inch and a half would be so wrapped over probably as to be concealed by the folding of the paper?—But I think I have missed the point. I propose that the word "margarine" alone should be utilised.

1909. Yes?—In the form of letters; and in my experience there is no paper used for wrapping up margarine so small that you could not print the word "margarine" in letters of that size upon it.

1910. But it might be wrapped inside the

Chairman—continued.

package, and not outside?—It might be quite; that would have to be provided for.

1911. It is to be put on the paper in which the article is wrapped?—Yes; it should be on the outside, of course.

Mr. *Kearley.*

1912. That is the law at the present time, is it not?—It is the law that it should be marked.

1913. And sold in a wrapper with "margarine" upon it?—Yes, but not the word "margarine" alone.

1914. That is the point, I see?—Yes.

Chairman.

1915. With regard to the enforcement of the provisions of the Act, what have you to say on that subject?—I should like to adopt the plan which was suggested by Dr. Bell in his evidence some years ago, namely, that the provisions of the Act should not be permissive, but that it should be compulsory upon the authorities to carry them out.

1916. That is to say, that these Acts relating to the adulteration of food and drugs, and the Butter and Margarine Acts, should be compulsorily acted upon, that it should be compulsory upon the local authorities to enforce them?—Exactly so.

1917. But have you any suggestions to make with reference to that proposal; how would you enforce it?—That is a point which I do not think belongs to my province. I think that is a legal matter which might be left to wiser heads than mine.

1918. Would you propose to have inspectors from a central department whose duty it should be to see that the Acts were carried out?—I would propose that there should be inspectors, as they have in Denmark, not only to deal with places like London, but with the whole country.

1919. So that in that way, by a system of inspection, you would really make the compulsion effective?—Yes.

1920. With reference to samples, do you think that the form of purchase might be dropped by the inspectors of the local authorities?—I think that it might be extended so far as this, that the inspectors should be enabled to appoint any proper person whom they choose to select to take the samples, just as is done now in some of our provincial cities where the inspector appoints a woman or some unknown person to take the sample; and I think that any properly-appointed person should be enabled to take samples without the necessity of going through a form of purchase.

1921. So as really to sample those various articles in the way of ordinary inspection?—Exactly so.

1922. If you found a man repeatedly convicted of fraudulent adulteration, I suppose you would propose a heavier punishment than a fine?—I think after the third case had been proved against him, he should be liable to imprisonment for a fortnight upwards in accordance with what Mr. Lovell stated in evidence in 1887.

1923. That, you think, would be more effective than any money fine?—I think it would. Mr.

Chairman—continued.

Lovell, who, as I say, is one of the greatest men in the trade, said in 1887 that he believed that if imprisonment were adopted it would have a large amount of influence in checking the fraud that exists, and, I think, coming from such a man, that opinion is worthy of being taken notice of.

1924. With reference to your getting at the wholesale dealer, the invoice that is now given as a warranty you think is valueless?—I think it is valueless to this extent, that if it is proposed to exonerate the retailer upon his showing an invoice from the wholesale merchant, you are exonerating a man who may be guilty, simply because the invoice does not fix the material that has been seized or sampled.

1925. That is to say that the identity of the particular specimen to which the invoice refers cannot be proved?—No, it cannot be proved.

1926. Do not you think that your inspection ought to extend beyond the retailers' shops to the manufactories?—I think that retailers, wholesale dealers, and manufactories alike should be subject to inspection.

1927. So that all places where these food products are gathered together, or manufactured, should be open to inspection, and under the control of the Acts?—I think so. One of the large manufacturers some years ago in his evidence said that he should personally welcome inspection, and he went so far as to add that he would be willing to pay the expenses of a Government inspector to reside upon the premises.

1928. With reference to the adulteration that goes on by way of mixing, you think that at present it is impossible to prevent it?—Yes.

Mr. *Whiteley.*

1929. Was the last answer with regard to margarine factories?—Yes, it was a margarine manufacturer who said that.

Mr. *Yerburgh.*

1930. Under the present law is there a power of inspection of margarine factories?—In the 10th Section of the Margarine Act it says "any officer authorised to take samples under the Sale of Food and Drugs Act, 1875, may, without going through the form of purchase provided by that Act, but otherwise acting in all respects in accordance with the provisions of the said Act as to dealing with samples, take for the purposes of analysis samples of any butter, or substances," and so on.

1931. May I draw your attention to the following words, "samples of any butter, or substances purporting to be butter, which are exposed for sale"?—That is in the Sale of Food and Drugs Act, is it?

1932. No, that is in the Margarine Act?—Will you kindly tell me the section?

1933. It is Section 10?—That is the one I am reading.

1934. You stopped at those words?—"Or substances purporting to be butter, which are exposed for sale"; that I take does not apply to factories.

1935. That is the point?—Yes.

Chairman.

1936. That is your opinion?—Yes.

1937. As regards the trading mixtures, have you anything to say on that?—I have several remarks that I should like to make on that subject. In the first place I would say that it is impossible to prevent the adulteration of butter unless you prevent the mixing of margarine and butter absolutely. Mr. Pearson, the buyer of the Wholesale Co-operative Society, which is the largest concern in the world, said in his evidence that he was opposed to the system of mixing as he believed that it conduced to fraudulent sales.

Mr. *Bolitho.*

1938. Was it in England or America that he gave that evidence?—In England; he said it before the Margarine Committee. I quote these two facts because they are important; and Mr. Lipton's manager, who I suppose is the second largest salesman, said that he could have done an enormous sale in these goods had he chosen to sell them without saying what they were. And I want to be permitted to quote from material which I have here: One wholesale merchant writes me to this effect, that a customer of his who was getting 25 casks of mixture a week is taking 10*s.* profit per cwt., instead of about 2*s.* or 3*s.* profit, which he would do if he were selling pure butter.

Mr. *Whiteley.*

1939. For mixture sold as butter?—Margarine mixture, sold as butter. I should like further to refer to a circular which is issued by one of the large butter and margarine shippers, in which the firm say: "There appears to be a great diversity of opinion existing among English analysts as to the purity of these butters. Some of the leading city analysts of the north have passed them as pure, whilst others, great authorities in chemistry, who have had samples of all the manufactures before them, have declared that they are certainly adulterated with 8 to 10 per cent. of foreign fat." Then a short time ago a deputation from the South of Ireland Butter Merchants' Association attended the meeting of the Limerick Corporation to call attention to the increased growth of butter adulteration, or mixture, in that city, when it was shown that tons upon tons of margarine were imported into Limerick, and spread through the country, Limerick is one of the headquarters of the Irish butter trade and of the condensed milk trade, the milk bought from farmers being skimmed by separators, and the skim milk converted into condensed milk, which is sold to the poorer classes, who believe it to be the pure article; while the butter is, to a large extent, known to be mixed with margarine, and sold in the form of mixture as pure butter.

Chairman.

1940. Do those remarks of yours apply to Limerick especially, or equally to all Ireland?—I refer to Limerick especially because of the fact of the South of Ireland Butter Merchants' Association attending there at a meeting of the Corporation of Limerick.

1941. But

Chairman—continued.

1941. But you think it might be equally applicable to other places?—Yes, unquestionably.

1942. These mixtures come from France, do they not, to a great extent?—To a large extent, I have some experience of that myself, and I should like to refer first to this fact, that the Chairman of the French Commission, who was in charge of the last Margarine Bill, stated in the French House that Normandy and Brittany butters were sent to England with 15 to 35 per per cent. of margarine mixed with them.

Mr. *Jeffreys.*

1943. Who said that?—M. Guillemin, the Chairman of the Commission appointed by the French Government in connection with the last Margarine Bill which was rejected by the House, largely, so far as I gather, from the evidence, because the Minister of Commerce declared that if the Bill were adopted it would destroy the French margarine trade with this country. The Bill proposed to prohibit colouring. Then again, if you will allow me to take you to another French instance, I was over a factory in the Department of Calvados in which margarine was being blended with butter for the English market, and I will put in evidence one of the labels of this factory, showing that it was sent to England as guaranteed pure butter. Since that time this man, who rose from being a workman in a similar factory to be master of a large concern, has been repeatedly fined. I went with the French Dairy Farmers' Association, as their English guest, to a number of places, and at another one, where we were treated with great hospitality but forbidden to enter the factory. The proprietor was a great blender of margarine and butter, and he has since been repeatedly fined; and has now been imprisoned by the authorities.

Mr. *Kearley.*

1944. Was not the other man imprisoned also?—No; he has been fined.

Chairman.

1945. Have you got the labels now?—I have no guarantee, but the label which is wrapped upon the butter, or rather the wrapper which is wrapped upon the butter for the English market, I have here.

1946. You had better put it in then?—Certainly (*handing in the same*).

1947. This is the label which is put on at the factory?—Yes; that is sent to England on the butter.

Mr. *Channing.*

1948. And this label is to enable this mixture, this blend, to be sent to the English market as pure dairy butter?—So I gather.

Chairman.

1949. That is to say it bears a stamp in blue letters, "Guaranteed pure butter"; and in red letters, "Pure dairy butter"?—That is so.

1950. Have you anything further to say on this part of the subject?—I took a party of English people to another factory which bears a very high name for its manufacture of butter, and those people buy butter in the open market, and send it to England. We were under the impression at the time, from what we were shown, although we were not allowed to touch it, that it was all pure butter; but since then I have been informed by a scientific adviser of these firms that they also blend, but blend very skilfully, in accordance with scientific teaching, margarine with the butter.

1951. Then those people buy in the open markets of Brittany and the western parts of France, the butter produced on the various farms, and afterwards blend it in the factory by adding to it margarine?—Yes, adding to it margarine in proportion to the ratio of the volatile fatty acids, I take it, and so escape any possible conviction. But I would suggest (if you will allow me at this moment) that it is impossible for a firm of this character to send butter of the quality that they buy, to the English market, and sell it at the price that they do, when the Paris prices are much higher than what they obtain in England. From my personal knowledge I have known butter sold in the Paris market of a similar quality (I speak as an expert in the matter) at as much as 2*s.* 7*d.* and 2*s.* 9*d.* per lb., and yet those people are taking from the English market 14*d.* and 16*d.*

1952. Is the butter that is sold in the Paris market pure butter, or blended?—Pure butter, unquestionably.

1953. Then the French do protect themselves against those frauds, and we are open to them?—I do not think they do to a sufficiently large extent. I believe that the French are imposed upon enormously; but they have an advantage in the Paris halles, that the butter is sold, not as with us, but it is sold by auction in the presence of a number of experts, each of whom has an opportunity of sampling it as it is being sold. They have a very long slide which reaches from the auctioneer's desk right down the halle, and on each side of this slide the butter is passed in baskets or boxes; the buyers are on either side, and they sample it as it goes down.

1954. But it would be impossible in a process like that to detect a small percentage of margarine?—No doubt; but I think that the best Paris shopkeepers are sufficiently alive to the very finest quality of butter not to buy a sample that is adulterated to any appreciable extent, in fact not at all; for I think that it would not pay a man to adulterate to a small extent; therefore they are practically free.

1955. Is there no more accurate or scientific analysis made from time to time by which to detect adulteration?—Not in France.

1956. With reference to the sale in those particular places and under the circumstances that you have just described, I mean to say?—I do not gather the specific question.

1957. I pointed out to you in my former question that the ordinary observation of the buyers would not enable them to detect a small percentage of margarine?—No, it would not.

1958. Is there no other scientific method of analysis on which those buyers rely?—No.

Mr. *Channing.*

1959. Do they not have their samples analysed from time to time?—No, the buyers do not.

1960. They just judge from their observation? —Yes. The point that I should like to impress upon the Committee is that it would not pay those who send these small consignments of butter to the Paris markets to adulterate with a small percentage of margarine, whereas a large percentage would be inevitably detected by the buyer.

Chairman.

1961. Are these people that you speak of, who send this butter, persons who send only small consignments?—They are nearly all small farmers.

1962. It comes direct from farmers?—Yes.

1963. Not from factories?—Not from factories. There are a few cases in which it comes from factories. I know of one myself in a small village, in which I was staying with the mayor of the village, who bought from all the small milk producers in his parish; there were something like 200 occupiers of land in a very small parish, all milk producers, and they all delivered milk to him; he had a separator and made butter, and sent the whole to the Paris market. In this particular case, although he was living at the other end of the Department, he was branding the butter "Isigny," the name of the finest butter in France.

1964. Do these practices go on in Germany? —No, not to so large an extent. I have not so extensive an acquaintance with the system in Germany, but I know that the prohibition of mixing in Germany has largely discounted the mixing of the two articles.

1965. They are in a better position then, in Germany, than we are, or than they are in France?—Yes.

1966. Can you say anything about the Hamburg practice?—I have here a circular which was sent to me by the Produce Merchants' Association of Manchester some little time ago. In consequence of a considerable stir with regard to the adulteration of Hamburg butter, this association determined to take certain samples; I think, if I remember rightly, every member of the association agreed that on a certain day a sample should be taken from his butters, and in the long run the samples were sent to Mr. Allen, of Sheffield, and Dr. Bernard Dyer, of London, in duplicate. Of 11 samples sent six were found to be adulterated with margarine, and five were doubtful.

Sir *Mark Stewart.*

1967. Was it marked "pure"?—I cannot say. They were all bought as butter and sold as butter. I have another analysis of a sample of Hamburg butter containing 74 per cent. of butter fat only; and immediately after the sample was taken and analysed by the chemist a circular was sent out by the exporter, Mr. ——, of Hamburg, in which he lamented the fact that butter was being exported from Hamburgh to England with an admixture of margarine. This gentleman said: "The only way that I can see to regulate this business is for buyers to require from shippers an absolute guarantee as to purity of product, and that the authorities in England be directed to turn their attention to the adulteration of butter with oils, foreign fats, &c. My butters are warranted to be always pure, and this has been several times confirmed by analyses in England; further, a guarantee that the butter sold by me is free from oils, chemicals, and foreign fats appears on every invoice." This butter was then being sold considerably under market price, and the writer of this circular was the very exporter of one of the samples to which I referred.

Sir *Mark Stewart*—continued.

Chairman.

1968. Those words which you quoted were the words of a person who was an adulterator?— They are in his letter.

1969. Are they his words?—They are signed by him. They were sent to one of the buyers, who sent them on to me.

1970. You believe that experts have a good deal of difficulty in detecting these frauds?— That is so.

1971. With reference to mixing, how is the mixing managed?—I have seen it done, and can describe it; it is a very similar process to that of working butter taken from the churn. They have a very large table, some 5½ feet in diameter; the butter is first graded; I presume it is graded in accordance with its adaptability for mixing; I cannot tell you positively, but it would be if it were my case, or anyone who understood the business. Having provided the butter which is graded, the margarine is mixed in weighed quantities and placed upon the butter table; the two articles are blended together by the rollers, and simultaneously with the blending a small tank at the top of the machine filled with colouring matter and salt and water, is distributing through some revolving pipes the mixture over the butter and the margarine; so that simultaneously, as the machine is being worked with the pure butter, the margarine, the brine and the colouring matter are all being blended together, and in the end the mixture is such that you certainly could not detect it.

1972. And if they keep within a certain percentage of margarine, that is practically impossible of detection?—I believe that it is practically impossible of detection. That is a point which I will come to a little later on.

1973. Do these mixtures occur in English warehouses sometimes where they are described as pure?—Not long ago I was induced by a sample that was given to me to go to an English warehouse in the city of London. I asked to see the principal, and I saw the gentleman. I said, "This butter has been sold to a person who has handed it to me as pure, and I should like to speak to you about it." He replied to me in a very paternal manner; he told me how I could detect margarine by its influence upon the palate, and assured me that this was pure butter. It was quite wrong. At the same time he had a whole floor of the warehouse covered with boxes of this material, each of which was warranted pure butter. I had this sample analysed, and the analysis sent to me was that it contained 25 per cent. of margarine.

1974. Do

Sir *Mark Stewart.*

1974. Do you know the price that it was being sold at?—I would not like to say at the moment; it was either 1*s.* or 1*s.* 1*d.* per lb.

Chairman.

1975. These mixtures are largely used, you think, in hotels and restaurants?—They are.

1976. On what do you base that opinion?—From my own experience. As I have mentioned, it is impossible under certain circumstances to say with certainty that an article described as butter is really butter or not; but when the percentage of margarine is sufficiently large for an expert to tell, he can tell; and I think I am warranted in saying that I can tell myself inevitably if the percentage of margarine is sufficiently high, say one-third.

1977. What effect would the margarine have upon your palate?—It melts much more rapidly and there is a flavour of the fat of the bullock, which to my mind is a sure sign that you are not eating pure butter.

1978. You cannot convey to us any rough test by which margarine can be detected?—I do not think so, except that if you try a number of samples I think you would be able to tell very soon. Some of these have been analysed subsequently, and my judgment has been confirmed.

1979. Butter-tasting has become a fine art then; it requires at all events a good deal of skill to detect these things?—I think it is experience more than skill that is required. I may give you another instance. Three or four years ago the British Dairy Farmers' Association held their annual conference in Scotland, and we were invited to a large margarine factory at Dunragit in Wigtonshire, a factory I believe conducted upon very proper principles; they make butter also, and I think other products. Among other things we were shown some very beautiful samples made up in the form of butter, and we were invited to test them, and express our opinion upon them, I had had some little experience of the matter before, and did not taste them, but nearly every one did who went into this particular dairy, and without a single exception, I think, every person praised the samples as being perfectly pure, good, high-class butter; and they were subsequently astonished when they were told that they were three different samples of margarine, three different blends at different prices. So that even a party of experts may be easily misled and deceived when a sample is made up in a very skilful manner.

1980. That bears out the observation which I made just now, that it is very difficult to detect by the mere taste?—I think it is. I should like to add, that I do not reflect for a moment upon this factory; I believe those who run it are doing so upon proper and thoroughly fair principles.

1981. Have you anything to say as regards the comparative cost of butter and these mixtures?—Yes. The point that I would put to the Committee is this, that if pure butter costs 112*s.* per hundredweight it would be possible to mix it with 25 per cent. of margarine and to produce the same at 100*s.* per hundredweight, and thereby to realise an extra profit of 12*s.* per hundredweight; that is to say, assuming that the work were skilfully performed. In this way it seems to me

Chairman—continued.

that the poor are defrauded rather than anybody else, and we are simply paying a bounty upon foreign fat.

1982. The poorer classes are defrauded, but they get a cheaper butter, do they not?—But they pay the price of butter of a higher class.

1983. But is the butter less nutritive that they obtain?—I should say so.

Mr. *Channing.*

1984. Is it butter at all?—In this case it will be 25 per cent. of margarine, which would be margarine by the Act.

Mr. *Kearley.*

1985. Your point is that they pay 100*s.* per hundredweight for margarine?—Yes, they are paying for the mixture the price of butter.

Chairman.

1986. But you said the price of the butter was 112*s.* per hundredweight?—Yes.

1987. You say it is sold at 100*s.*, which is 12*s.* less than its price as butter?—My point is that it is possible to mix with a butter costing 112*s.* per hundredweight margarine to the extent of 25 per cent., and to sell the mixture at 112*s.* per hundredweight.

1988. That is wholesale, not retail?—Yes.

Mr. *Bolitho.*

1989. What would you put the cost of margarine at?—Sixpence a pound, or you can buy it as low as 4*d.*

Chairman.

1990. Is not this butter mixture sold under those circumstances at a lower price than butter?—No; I think it is sold at the same price; that is the most crucial point.

1991. That is what I wanted you to bring out, because we were told by a former witness that at many shops these mixtures were sold at a lower price than pure butter, and that consequently it had a tendency to lower the market price of butter, and to give a dishonest profit to those who are selling margarine as butter?—Probably this is what was meant: that the manufacturer or merchant was selling a mixture to the retailers at a lower price. I think he does, because I believe that the retailers, taking them as a whole, are responsible for the frauds that exist, but that they make the public pay the full price?—I have no doubt whatever.

1992. Cannot you conceive that if there are three or four shops in a town one man may create a business by selling butter which is a mixture of margarine and butter at 10*d.* a lb. against his rivals who are selling pure butter at 1*s.*; and by so doing he will tend to lower the price of butter in the neighbourhood?—I do not think he would; I think it is a question which the public discriminate in. The public in the South of England, at all events, want a mild unsalted butter, and they get it in the form of this mixture.

1993. Which they are unable to detect?—Which they are unable to detect. My own belief is very distinctly that the modern taste for this exceedingly mild butter that we get in

Chairman—continued.

London has been created by the margarine manufacturers.

1994. But that taste having been created has an influence on the market?—It has an influence to this extent, that the public are willing to pay higher prices for the mixtures than they are worth.

1995. But they are less willing to buy pure butter?—They are; but one may look at it in this way: that a person who likes this particular mild butter can go into the market and buy the pure butter and the pure margarine, and make the mixture at home at a considerably less price, as they do in Denmark; that is their practice.

1996. That is to say, the purchaser makes the mixture?—He does.

Mr. *Kearley.*

1997. The consumer does that?—Yes.

1998. It is not legal, I think, in Denmark to mix butter and margarine together?—Practically.

1999. It is illegal, is it not?—It is not, as expressed by the Act, but it is practically illegal, because of the law in regard to colour.

Chairman.

2000. Have you any other instance?—I will give you another instance. I was shown over a very large factory owned by a Dane who came to England when the Danish law was passed, because he could not carry on his practice, I suppose, in Denmark. I was shown over very kindly by his manager, of whom I have nothing to complain; and I was shown a sample of mixture upon leaving, which I was asked to pass an opinion upon. I said to him in reply: "If this was shown me anywhere else I should say it was a little sample of pure butter." He said, "It is not; it is a mixture which is sold at 11*d.*" the inference being that it was sold by the retailer at 11*d.* But I was quite convinced that it could have been sold at 2*d.* or 3*d.* a lb. more with perfect confidence by the retailer.

2001. So that practically, a mixture skilfully prepared in that way is just as saleable as pure butter?—Yes.

2002. And as well appreciated in some respects by the public?—It is as much, and probably in some cases more.

Mr. *Whiteley.*

2003. Is it as wholesome and nutritive as butter?—I think that it is pretty well determined by scientific men that butter fat is more digestible than any other kind of fat, but the honourable Chairman will probably know more about that than I do.

Mr. *Yerburgh.*

2004. Are you aware of the price of margarine in this country, sold as margarine, without any admixture of butter, or without any colouring?—It is constantly offered at 6*d.*, and I have seen it as low as 4½*d.*

2005. That is margarine without butter being mixed with it, and without being coloured?—There is no margarine sold without any admixture of butter, for this reason, that in the manufacture of margarine oleo is mixed with milk to the extent of several hundred pounds of oleo with 1,000 lbs. of milk; then the two materials are churned together, and the result is that about 5 per cent. of butter fat remains in the margarine, what you call the pure margarine.

Mr. *Yerburgh*—continued.

Mr. *Kearley.*

2006. That is allowable I believe in countries where they forbid the mixing of margarine and butter in the process of margarine manufacture?—Yes, it is in Denmark, where they allow 6 per cent.

2007. Where they object to butter and margarine being mixed, they do allow that margin of butter to be absorbed in margarine by reason of mixing the cream in the process of manufacture?—Yes, and they allow of colouring also which results from the mixing. The author of the Danish law was, to a very large extent, Professor Segelcke, who has a great reputation in Denmark. He took me to see how the thing worked in the retail shops in Copenhagen. The retailer sells butter and margarine in the same establishment, the margarine all being exposed in oval tubs; and he said that the bulk of his customers or rather those who bought the cheaper kinds of butter, preferred to buy 2 lbs. of margarine and 1 lb. of butter; and in that case he always presented them with a small capsule of colouring matter with which they made the mixture at home. That is the practice really of the lower middle classes in Copenhagen; they make their own mixtures.

Chairman.

2008. They make their own mixtures of margarine and butter?—Yes.

2009. And they colour it?—Yes, with the colour presented gratis.

2010. Have you anything to say about the prices in Paris and London comparatively?—I have referred to the prices in Paris already; and I made the remark which I meant to have made here, if I had not then been called upon, that it is impossible for the French exporter to sell the highest class of butter in our market at the price that he does when the prices in Paris rule so high.

2011. Have you anything to say about the prices of butter generally?—I have some evidence upon that point. I have here an estimate made last year by the American statistician, Mr. Dodge, that the average price of butter in Denmark was 1*s.* (that is for the year); in France 11¾*d.*; in Sweden 11¼*d.*; in Norway 12¼*d.*; in Australia 10*d.*; in Holland 11*d.*; in Germany 11½*d.*; in Belgium 11¼*d.*; in the United States 8¾*d.*; and in Canada 9⅛*d.*

Sir *Mark Stewart.*

2012. What is it in this country?—I have not got that for the same year; because it is practically impossible to give any English price at all. The price as quoted in the papers, and in the Agricultural Returns, I look upon as being worthless, because our market is so essentially small. Butter sold in England is principally sold by retailers in the country towns; the butter sent to London is very small in quantity.

2013. The

Sir *Mark Stewart*—continued.

2013. The Irish butter comes over in large quantities, does it not?—But the Irish have their own quotations. I can give you them.

2014. What is the Irish average?—I am coming to that presently.

Chairman.

2015. Passing on now to the output of margarine on the Continent, can you give us any figures on that point?—I have data here provided by the President of the French Commission, to whom I have already referred, M. Guillemin. In speaking of the margarine trade, in Holland, he says that the amount imported from America was 17¾ million kilogrammes; from France 7½ million kilogrammes; from Austria . 8 million kilogrammes; from England and Germany 3½ million kilogrammes; yet the French Customs returns for 1886 only give a total export of 4¼ million kilogrammes of margarine to all countries.

Sir *Mark Stewart.*

2016. What is a kilogramme?—Two-and-a quarter pounds.

Mr. *Channing.*

2017. Can you give the totals?—I will give you the totals of margarine and margarine oil imported into Holland. But, first, may I quote to you this statement of Mr. Dodge, to whom I have referred already, and who says that "the total exports of oleomargarine oil amounted in the past year" (that is 1891) "to 68,000,000 lbs."

Mr. *Kearley.*

2018. Into Holland alone?—From America, a large portion of which went to Holland.

Mr. *Channing.*

2019. To all countries?—From America to all countries, but the bulk went to Holland.

Mr. *Bolitho.*

2020. Holland is the great mixing centre, is it not?—Yes.

Mr. *Kearley.*

2021. Holland is the great margarine manufacturing centre, not necessarily a mixing centre?—It is the great centre from which they send the raw material as well as the mixed material.

2022. But, I think, perhaps, that Mr. Bolitho, did not quite understand that Holland is the great margarine manufacturing country?—Yes.

2023. Not necessarily the mixing centre?—No.

Chairman.

2024. Then the import of this enormous quantity of margarine into Holland, or some other cause, has reduced the butter sale, has it not?—I think it has.

2025. And has increased the sale of impure butter?—Yes, and has decreased the price, of course, for pure butter. In a pamphlet of my own, written in 1892, I say, "During the past 10 years the average price of butter has been 8½*d.*; during the preceding ten years it was 9*d.*, whereas in the ten years between 1861 and 1870 it was 11½*d.*" This is in America. "Mr. Dodge"

Chairman—continued.

(to refer to him again) "does not consider that these prices suggest any bar to continued participation in the markets of other countries, but adds, that the average cost of butter imported into England in 1889 was 11½*d.* per pound, while the exports from America averaged only 7*d.*, and yet he is himself paying 1*s.* 8*d.* for butter for his own use." That is in New York.

Mr. *Whiteley.*

2026. Have not the prices of all commodities besides butter been falling during that time?—I am afraid they have for agricultural produce. "During the six years 1884–1889 there was an annual average export of 40,000,000 lbs. of the oil, and from one to two million pounds of imitation butter, while in 1890 the aggregate export of these articles reached 70,000,000 lbs." That is for the United States.

Chairman.

2027. Have you anything more to say about Holland and the Dutch with reference to this matter?—I have an important paper upon the exports of Holland which I have got out for the years 1885 to 1892. In 1885 the butter exported amounted to 307,000 cwts.; in 1892 it had fallen to 141,000 cwts. In 1885 again the export of margarine was 772,000 cwts.; in 1892, that is seven years afterwards, it had increased to 1,196,000 cwts., so that continuously with the fall in the export of butter from Holland to this country there had been a rise in the export of margarine. Then from 1877 to 1887 the imports of tallow and lard into Holland rose from 25,000,000 kilos. to 72,000,000 kilos., the total in the five years imported being 159,000,000 kilos. I think I have shown in this little work of mine that the exports of imitation butter, or margarine, from Holland to this country, are equal to about 5 lbs. per head of our population per annum.

Sir *Mark Stewart.*

2028, That exportation of 5lbs. of margarine per head of our population was from Holland alone?—Yes; from Holland alone.

Chairman.

2029. With reference to Danish exports, they are affected a good deal by the Danish laws, are they not?—I believe they are.

2030. Have you anything to say about them?—In the eight years from 1878 to 1885 the Danish exports increased from 11,000,000. lbs. to 35,250,000 lbs.

2031. Have you anything to say about the registration of sellers of margarine, or the licences of the United States in connection with that transaction?—In the United States the Federal Government requires that each person selling margarine shall take out a licence; these licences, costing from 48 to 600 dollars; that is in proportion to their trade, whether they are retailers, manufacturers, or merchants.

2032. That licence system, you think, has a good effect in preventing fraud?—It has a most important effect, so the Commissioner assured me.

Chairman—continued.

2033. How would it affect butter dealers?—I am afraid that I cannot give you a very distinct answer to that question. I believe that the fact of a person being registered, and paying a licence, has an important influence upon his trade.

2034. Would it require a man selling butter, if he dealt in butter and margarine as well as butter, to have a licence for selling margarine, or would it only apply to the manufacturer who introduced the article, and sold it to him?—I am afraid that I cannot answer the question.

2035. Have you anything to say about the working of the existing laws with reference to samples in the past few years?—Two years ago the British Dairy Farmers' Association took a number of samples, and we did so again recently. On the first occasion several of the samples taken were analysed, and found to be adulterated; but recently one lot of seven samples taken contained three which were mixed with margarine in accordance with the certificate of the analyst.

2036. There was a special case at Gloucester, was there not?—That, I think, has been already dealt with by Mr. Embrey or by Colonel Curtis-Hayward. I had intended to refer to that.

2037. Have you any other instances to give us?—I think that those persons who in retailing those materials use the marble screen upon their counter, should be particularly looked after. It is part of the appurtenance or fitting of a butter shop; and if a customer goes into a shop and asks for half-a-pound or a pound of butter, they go behind the screen to make it up with their patters. I believe that there the mischief is done because they have in the left hand corner a large lump and in the right hand corner a similar lump, and they can take a piece from each and make a blend of it on the spot, and hand it to the customer. If it is a child or an old woman, they can make it up with a larger proportion of margarine, and if it is a person who may be an inspector, or a suspicious looking individual, they probably make it up pure. But the marble screen is unquestionably a thing that ought to be done away with, or inspection kept very close upon it.

Mr. *Whiteley.*

2038. Might they not according to Act of Parliament be of a certain shape or form?—I do not suggest that, but I think that when a person is buying an article of food, it should be made up in the open. Unless a man has something to be ashamed of, he should not make it up behind the marble screen.

Mr. *Bolitho.*

2039. I suppose that the mixing would be done in a very imperfect way?—No; you can make it up on a marble slab before the customer; it is commonly done. But some butter shops invariably have these marble screens, and it is about the only ornamental material on their premises.

Chairman.

2040. Have you anything to say about a seizure that was made in Constantinople?—Yes; I refer to that to show how possible it is to seize a very large quantity of an adulterated article in transit. In this case 600 casks were seized, and analysed, and found to be margarine, although they were offered for sale as pure butter.

Chairman—continued.

2041. Seized by the Turkish authorities, do you mean?—Yes, seized by the Turkish authorities; that is only just recently.

Mr. *Kearley.*

2042. Was that in course of transit to England?—It was in course of delivery to the merchants in Constantinople.

2043. For re-shipment to England?—I could not say that.

2044. It is not regarded as an exporting point at all?—No, it is what might occur in this country.

Chairman.

2045. I think you have something to say as to the possible failure of detection by analysis?—On that point I should like to refer to the opinion of one very eminent man, and to facts which were ascertained by two others. Duclaux, who is the first chemist with regard to dairying in France, says in the "Journal de l'Agriculture" of Paris, that he obtained analyses of butter from Isigny, from Calvados, from Orne, from Prévalaye, and from the department of the Meuse, and that he obtained the proportions of volatile fatty acids which, expressed in butyric acid, varied from 4·54 per cent. to 7·04 per cent. In the butters of Isigny and Calvados the range was from 4·90 to 6·03; in the butters of Valognes from 5·58 to 6·19; in the butters of Cantal from 5·41 to 7·04. The average of 28 analyses was 5·63 with a range of 2·5 for a maximum equal to 7 per cent. Thus it is possible to take a sample of Cantal butter furnishing by analysis 7 per cent. of volatile fatty acids, to mix 23 per cent. of margarine, and to produce a mixture which by analysis would show 5·4 per cent. of the same volatile fatty acids; that is to say, as much as is found in the butters of Cantal. And he says further, that to the pure butters of Isigny (that is the best butter in France) you could similarly add 19 per cent. of margarine, and bring them within the range of fatty acids recognised by the chemists.

2046. So that practically the working standard of analysis of butter can in all these cases be approached by an adulteration varying from 19 to 23 per cent. of margarine?—Yes, as in these cases. The point that I should like to impress upon the Committee is this: that taking the volatile fatty acids of margarine as 1 per cent., and the range of the same fatty acids in pure butter as from 4·5 to 7 per cent., it is possible by taking a butter containing a high percentage of volatile fatty acids, to mix it with margarine, and to present a mixture which would come within the range of from 4·5 to 7 per cent.

2047. You have, I believe, made mixtures yourself for analysis?—Yes.

2048. Can you give us some narrative of your own experiments?—I hardly know how to approach the point, because it reflects upon chemistry; but to put it briefly, my experiments have been carried out to this extent. I have mixed

Chairman—continued.

mixed pure margarine, that is to say, margarine containing the minimum quantity of butter fat, with butter made in my own dairy, and these mixtures have been subjected to analysis with the result that in no single case has the exact figure been given, although in several cases the difference between the actual mixture and the analysis, was consistent; there was the same difference in each case, and that was with one chemist.

Mr. *Channing.*

2049. How many test cases did you take?—Last year I took four, and the quantity of butter and margarine mixed was in one case 50 per cent., in another case 33 per cent., in another case 25 per cent., and in another case 12½ per cent.

Chairman.

2050. Those mixtures were made by you?—Yes.

2051. And they were not detected by this chemist to whom you refer?—No, I did not quite say that; they were detected by one chemist, although his figures did not agree with mine; but they were consistent with each other. The difference was the same in every case.

2052. Were the cases in which he detected it those in which the larger percentages of margarine were added?—No; there was the same difference in each case.

2053. In all the specimens?—Yes.

Mr. *Channing.*

2054. Were they all done by the same chemist?—Yes.

Mr. *Kearley.*

2055. Did he detect margarine in every case?—Yes.

2056. He diagnosed margarine iu the case of 12½ per cent.?—Yes.

2057. In every case?—Yes. There was variation, although the variation was the same in each case.

Mr. *Whiteley.*

2058. What was the lowest percentage of margarine that you put in?—Twelve and a-half per cent.

2059. And he detected that?—Yes.

2060. He did detect 12½ per cent.?—Yes; but I should tell you that the butter mixed with the margarine was not specially selected because of its percentage of fatty acids.

Chairman.

2061. Then you did not make your mixture so scientifically as it would be made by a person desirous of committing a fraud?—No.

2062. He would calculate the amount of fatty acids previously?—Yes.

2063. And add the margarine in proportion?—Yes.

Sir *Mark Stewart.*

2064. Did he detect the amount of margarine in each case, or approaching it?—I can give you the figures.

Chairman.

2065. Can you give us the name of the analyst?—I do not want, if you will excuse my saying so, to fix the chemist.

2066. Can you give me the figures without giving the chemist's name?—I think he would fix it himself in that case. In the highest case the analysis was 40 per cent. of margarine.

Sir *Mark Stewart.*

2067. What was the actual amount?—Fifty per cent.; and there was a similar difference in every case almost.

Mr. *Channing.*

2068. It was about 20 per cent. less; was it a uniform drop in the analysis in each case?—It was uniform in proportion to the actual mixture.

2069. Therefore the analyst was, if anything, over fair to the adulterator?—Perfectly fair to the adulterator.

Chairman.

2070. Have you anything to say upon this point?—If you will permit me, I should like to finish this matter by reference to some experiments made by the French.

2071. Certainly?—This is a report made by two French chemists, MM. Maurice Boucherie and Jules Le Conte, upon the adulteration of butter by the use of margarine. These gentlemen were appointed to do this work, and they say: "We have sent to the two first laboratories in Paris, directed by men of great competence and skill, two sets of fifteen samples of identical butters prepared by ourselves, the one set pure, and the other set mixed with margarine. They came from Normandy, from the Ardennes, from Allier, and from the Midi. We have asked at the laboratory first for the chemical analysis properly so-called, and secondly for the determination in the fatty matter of the proportion of volatile fatty acids present, and the fixed or insoluble fatty acids." Then they say: "not only have the replies sent from each laboratory with regard to the same samples not been in accord, but in several cases the volatile acids were superior in the margarine samples to those found in the pure butter, from 15 to 20 per cent. Besides, each series from one laboratory was characterised by figures which were relatively high as regards the margarine. The average of 15 samples, of which 10 contained margarine, was 7·15, while in the other case, also an average of 15 samples, the result was 4·69."

2072. Of fatty acids?—Yes; or only two-thirds of the volatile fatty acids found in the other samples?—That appears to me to be quite conclusive, because it is dealt with by very competent men who are themselves criticising chemists of the first eminence.

Mr. *Kearley.*

2073. Can yon sum up what you meant to convey to us by that; it is rather technical?—Fifteen samples were sent by two chemists to the two principal laboratories in Paris, and they asked them, first for the analyses, and secondly

Mr. *Kearley*—continued.

for an account of the percentage of the volatile and fixed fatty acids.

2074. With what object was that; that is a point that I cannot quite follow. It was to deduce something; they were going to arrive at some result by deduction?—As I explained just now, margarine may be taken to contain about 1 per cent. of volatile fatty acids; I do not speak as a chemist, because I am not a chemist, but I know, as a fact, that margarine contains about 1 per cent. of volatile fatty acids, and butter contains from 4½ to 7 per cent.; therefore, a chemist, in determining what a sample is, is guided principally by the presence of volatile fatty acids. Accordingly, if you add margarine contain 1 per cent. in a certain proportion to butter containing a high percentage of fatty acids, say, 7 per cent. or 6½ per cent., you can still come within the range permitted, from 4½ per cent. upwards. Then the result of this was to show that of 15 samples, 10 of which contained margarine, one laboratory showed an average of 7·15 per cent., while the other showed, for identically the same samples, 4·6 per cent.

Chairman.

2075. This illustrates the variation in analysis by competent experts?—Yes, it does by competent experts.

2076. Therefore, it tends to show the difficulty of detecting these frauds when they are skilfully perpetrated?—Yes.

2077. I think that concludes that point, does it not?—Yes.

2078. Now about the colouring, what have you got to say about colour, and its use in checking frauds?—It may appear that I have given my case away by referring to these analytical difficulties, but, I think, remembering that fact, it is impossible to entirely check or to check the sale of margarine as butter, unless you provide that it shall not be coloured; that, as in Denmark, it shall contain no other colour than that given to it by the small quantity of milk added to it in the process of manufacture.

2079. The colour of margarine under those circumstances would be very pale, would it not?—Yes.

2080. Is there not growing up a taste for pale coloured butter in this country?—No, I think not.

2081. Do you think that the coloured butter is still more popular than the pale butter?—Yes.

2082. And that the popular taste would be sufficient protection if margarine were not allowed to be coloured?—Yes, I think it would be.

2083. Can you give us the result of any experience in Copenhagen about this?—I should like to hand in these samples of colouring (*handing in the same*).

Mr. *Kearley.*

2084. They definitely fix one of these colours in Denmark by Act of Parliament, do they not?—Yes; No. 9, it is in the Act.

2085. Not by an Order in Council?—No, by Act of Parliament. The point in this case is

Mr. *Kearley*—continued.

that when the inspector takes a sample of margarine to compare with those coloured charts, he can take a slice from a butter tub, or he ought to do so, I should say, and compare it. It will be recognised by the Committee in a moment that a large quantity of lightly coloured fat, like margarine is in that case, present in a tub would look much deeper in colour than if it were taken in the form of a thin slice, therefore the manufacturer and retailer in Denmark has the advantage that he is able to sell a deeper coloured margarine than he could do under proper conditions. What I suggest is that in that case if the same plan were adopted in England we should permit the inspector to take his colour from the bulk of the material, taking a fair slice, say half an inch or an inch thick, because there is a great difference between the two.

Chairman.

2086. In that way you think that he would be able by a scale of colours like this to separate the palest coloured butter from the highest coloured margarine?—Yes, I do. Then again there is no real comparison between the two articles. Margarine, which is pure and uncoloured, and butter, are essentially different in colour. An uncoloured butter is sometimes much whiter than margarine, but the whiteness is not at all similar to the colour of margarine which is pure.

2087. That is to the skilled eye?—I think to the public eye, to the continual buyer.

2088. Then the prohibition of the colouring of margarine would be, in your opinion, a sufficient check to adulteration?—In conjunction with the prohibition of mixing.

2089. You would require the two?—Yes.

2090. What is the result of the Danish law in that respect?—The Daaish law has resulted in this, that the public practically buy all the margarine that they require in its natural colour; that fraud has been reduced to a minimum; that the export of margarine is very trifling indeed; that the butter trade has had a continuous upward movement although prices have fallen all the time, and that the public are perfectly satisfied.

2091. Then you would obtain this disadvantage, would you not, that all uncoloured butters would practically be unsaleable?—I do not think so at all.

2092. Do not you think that uncoloured butter under these circumstances, when it approached the colour of margarine, would be looked upon with great suspicion in the shops?—I do not think so. Uncoloured butter, it may be observed, is very seldom seen; it is an article that you do not see in London; you may have to search a long time to find a single pound of it, and in country shops it is only found in winter, and then only in small quantities, because the most ignorant farmer has long ago been acquainted with the fact that he has only to add a Guernsey or Jersey cow, or a red-poll to his herd, to improve the colour of his butter; and he does that because he knows that it improves the colour which the consumer likes, as well as the quality.

2093. They

Mr. *Kearley.*

2093. They use anatto as well, do they not?—I believe it is going out; it is very seldom I see such a thing.

Mr. *Channing.*

2094. Do you suggest that the colouring of butter should be prohibited?—I do not. I think that would remedy itself by the addition of a cow.

Mr. *Yerburgh.*

2095. Have you ever considered the expediency of colouring the vessels in which margarine is imported, or in which it is sent down to the retailer from the manufacturer in this country?—No.

2096. Do you think that it would be any protection to colour the tubs in which it is supplied?—If the tub is of a specific shape, as it is in Sweden and Denmark, I do not think that it would have any influence, the shape is so easily recognised; it is oval in Denmark, and oblong in Sweden.

Mr. *Kearley.*

2097. Is it not the fact that the margarine manufacturers imitate all the butter manufacturers?—Yes, and they are willing to send you anything you like.

2098. Either in prints, rolls, or Normandy baskets?—Yes.

2099. Do not you think that that ought to be prohibited?—That is the next point that I am coming to.

Chairman.

2100. Have you anything to say upon this point of colour as to either Danish or French experience?—It is said that if you prohibited the colouring of margarine you might still be able to buy it coloured, because of the difficulty of distinction; but I would say that if margarine is uncoloured, and is made in factories which are inspected, and in which mixture is prohibited, it would go certainly from the factory to the wholesale man, and, in all probability, from the wholesale man to the retailers in its natural condition, in its natural package, and therefore you have a very large guarantee that, in the first place, there would be no mixture at all.

2101. No mixture before it reached the retailers?—Yes; and then I think that the retailer would himself be very chary indeed of emptying oval boxes of margarine, and mixing them, on premises which were liable to inspection. I would further say that the colouring enables any seller to-day to sell impure articles to the majority of buyers, the colour alone.

2102. That colour alone practically covers the fraud of selling margarine, or butter and margarine in which there is a large percentage of margarine; that fraud is protected by colour?—I think so, I would emphasise the point, because the grocers who met in Belfast the other day, and who were very fairly agreed as to most of the points, a certain number at all events, have put forward an objection to the prohibition of colouring, but I have thought it over very much indeed since then, in every bearing, and I cannot but think that that is the one essential point, to prevent fraud; because so long as the chemists are unable to detect to a nicety the presence of margarine, I do not think that anything else will check it.

Chairman—continued.

2103. So that in the face of the failure of scientific analysis, you believe that a practically efficacious method of checking adulteration is to be obtained by preventing the colouring of margarine?—I do, especially after the Danish successes.

Mr. *Whiteley.*

2104. Could you not obtain the colour of butter mixture by mixing butter of a very high colour with margarine by a clever fraudulent dealer?—So far as I gather your question, I will put my answer in this way: that if you prohibit the colouring of margarine there will be no butter mixed with the margarine. You could not possibly mix butter with margarine, because you would overstep the mark; you would make your shade of colour higher than the standard shade.

Chairman.

2105. I do not quite understand you. If you mix margarine without colour with butter, you would not get a higher standard; you would get a lower standard?—I do not understand the point.

Mr. *Kearley.*

2106. I think I can elucidate it. I understand you to say that the prohibition of colouring margarine alone would not be efficacious unless it is accompanied by the prohibition of mixing margarine with butter?—That is so.

Chairman.

2107. Is there anything that you wish to add to that point?—I think not.

Mr. *Channing.*

2108. You do not wish it to go down in evidence that you consider the whole system of scientific analysis for the determination of the presence of margarine in any sample, to be a failure?—Not at all, I think that I should accept the analyses of the best experts that we have in almost every instance, some of whom have given considerable attention to the analysis of margarine. I think it is a matter of experience, to a very large extent, although I am bound to say that I think by skilful mixing of the two materials it is possible to puzzle any chemist when the mixture is made sufficiently low.

2109. As to the proportion of margarine you mean?—Yes; in fact they admit it themselves. I have letters from eminent chemists here which I could quote.

Chairman.

2110. About the packages of margarine, you would have them made in a definitely fixed form?—Yes, for the simple reason that the manufacturers send out circulars actually offering to provide not only any kind of package, basket, box, or tub, but to make up the margarine in rolls, pats, or any shape you like in order to meet your market.

Chairman—continued.

2111. And that, you think, ought to be prohibited strictly?—Yes, and that they should be required, as in some other countries, to use a vessel of a specific shape.

2112. What is the Danish law on this subject?—The Danish law provides for an oval tub.

2113. And a label?—Yes, I have a label with me. These are the Danish labels of margarine, cheese, and margarine, with a guarantee of the percentage (*producing the same and handing them in*). The Danish law provides for forms of account to be kept, and those are the forms.

2114. This large margarine label indicates 6 per cent.; I suppose that is the margarine limit?—As being the limit.

Mr. *Kearley.*

2115. That is the percentage not of margarine but of butter fat?—I beg your pardon, of butter in margarine.

2116. Incorporated by the process of washing it with milk and cream?—Yes.

2117. In the process of making margarine pure and simple?—Yes.

2118. With no fraudulent admixture?—No.

Chairman.

2119. Then about the Swedish law, have you anything to say about that?—The Swedish law is much less severe, or much less perfect, than the Danish law; but the principal thing that results by the Swedish law is the prohibition of the importation of margarine, and the use of special boxes.

2120. Special in shape or colour?—Special in shape only.

2121. Then as to the German law, what is that?—According to the German law margarine must be sold in the form of a cube, and labelled; and there is a clause providing for the imprisonment of persons who have been repeatedly fined. Shops must be labelled to this effect: "Sale of margarine"; mixtures are prohibited entirely; and I may add that since the Act was passed the prices of the mixtures of margarine have fallen considerably.

2122. Then with regard to the Belgian law, what have you to say?—In accordance with the Belgian law of 1890, every manufacturer of margarine or person preparing mixtures is open to inspection; inspectors are able to enter all places of preparation of margarine at all hours, and butter must not be made of any substance which is not produced from whole milk; that is to say, that butter must not have incorporated in it any substance which is not produced from whole milk.

2123. Then what is the French law?—The French law, I should simply say, is now under consideration in a Bill which was presented to the Chamber. Perhaps I had better put this in, it is rather lengthy.

Mr. *Channing.*

2124. Is that the Bill now before the Assembly?—Yes; it is the proposed Bill.

Mr. *Kearley.*

2125. Has not that Bill been under consideration much in the same state as it is in now for two or three years?—This is altogether a new Bill.

2126. There has been an attempt to legislate on the subject in France for the last two or three years, which has been abortive?—Yes.

Chairman.

2127. This is the last attempt?—Yes (*handing in the same*).

2128. Have you any information as to the law in the United States?—With regard to the United States, perhaps you will allow me to quote from a report of my own in the journal of the British Dairy Farmers' Association. "In 1883 the quantity of margarine sold in the State" (that is the State of New York) "amounted to 15,000,000 lbs. per annum; to-day, margarine is neither manufactured nor sold. In 1885," (this in passing) "the milk shipped to New York and Brooklyn consisted of 4,835,831 40-quart cans. The 1893 report says, that in the past year the sale had increased to 7,040,342 cans, in addition to 61,000,000 cans of condensed milk, and 182,000 cans of cream. On one occasion 16,370 cans were inspected, and only 88 were found to be doubtful in quantity. The Assistant Commissioner, Van Valkenburg, a delightfully original man, and a deadly foe to the margarine maker, with whom I had an interview, says that between 1884 and 1893 the city milk consumption has increased over 90 per cent., while the population has increased only 25 per cent. He believes this to be entirely owing to the fact that the public are supplied with pure milk. In 1892 the dairy goods handled in New York State reached 29 million dollars in value (nearly 6,000,000*l.*), of which 5½ million was the product of New York State." The manufacture and sale of margarine are entirely prohibited in the State of New York.

Mr. *Channing.*

2129. The manufacture also?—Yes; this Assistant Commissioner is the man who has had the work during the past seven or eight years, of what he termed killing the trade.

Chairman.

2130. And he has effectually done it?—He thinks he has.

Mr. *Kearley.*

2131. Is there no export of margarine from the State of New York?—I do not think there is any.

Chairman.

2132. Have you anything to say about your personal experience in New York?—Not with regard to margarine; I may say that in Massachussets, to take only one more State, the law prohibits the sale of any imitation of yellow butter, and the sale in hotels, restaurants, and eating-houses without notice. A recent report by the Commissioner refers to the fact that although margarine boxes are obliged to be labelled or branded, yet the sellers are so ingenious

Chairman—continued.

genious that they pile in their shop windows and warehouses these boxes together to hide the brands; and therefore the Legislature of the State has devised a plan by which they are compelled to brand on every side, top, bottom, and sides as well in very large letters.

Mr. *Yerburgh.*

2133. Are you aware what the regulations are upon the matter of colouring in the State of New Hampshire?—That the margarine is to be coloured pink.

2134. And in the State of New Jersey?—I could not remember on the spur of the moment.

2135. Are you aware whether in the State of Connecticut there are any regulations with regard to the restriction of the sale of oleomargarine in restaurants?—In Connecticut; and it is prohibited to sell any margarine in restaurants unless the article is branded or declared to be such. That applies in five States.

2136. In Russia are you aware of any regulations with regard to colouring margarine?—I am not. In Minnesota, Iowa, and Wisconsin colouring is prohibited.

Chairman.

2137. Have you anything more to say upon that point about the law?—I think not.

Sir *Mark Stewart.*

2138. Do you know whether there is much adulteration in the United States?—Yes, a great deal.

2139. In spite of these prohibitions?—I do not mean that. In States where the law is strict, it is very much checked indeed; in fact, the trade is almost killed; but in the other States, where the law is chiefly permissive, adulteration is carried on to a large extent.

Mr. *Channing.*

2140. If there are exports of margarine from the port of New York, they need not necessarily be coming from the State of New York?—No.

Chairman.

2141. And with regard to the excess of water in butter, what have you to say upon that point?—I was a witness in the recent trial at Manchester in January last, when the Corporation took some test cases, and I should like to refer to a statement made by the stipendiary magistrate, who said that, in his opinion, after hearing a great number of witnesses on both sides, the question should be determined by the Goverment.

2142. That is to say, as to the quantity of water?—Yes.

2143. That there should be a standard fixed by Government?—Yes. Upon that point, having given evidence myself, and having heard almost all the evidence that was given, I should like to make the suggestion that the water standard should be 15 per cent.

2144. That is exceeded, is it not, in many samples, especially of Irish butter?—Very considerably indeed. It is a very difficult question to approach, because some Irish farmers, I am willing to admit, are behind hand, both as regards their possession of proper utensils and of proper water. I do not think it is a matter of skill, because they have capital schools in Ireland, and many means of learning how to make butter; but they have certainly not in all cases the utensils necessary; and as we were shown in evidence, and as I have seen myself, in Ireland, they often have not pure spring water, and without water below a fairly normal temperature you cannot expect to make butter which is sufficiently firm to enable the workers to get out the moisture.

Chairman—continued.

Mr. *Kearley.*

2145. That applies to dairy butter?—Yes.

2146. Not to creamery-made butter?—No.

Chairman.

2147. Then you think that the excess of water in Irish butter is due to the methods of manufacture in those separate farms?—I think so in some cases; I only apply it to a moderate number of cases. But I take it that if a person makes an article of food, he should be prepared and equipped with everything requisite to enable him to do his work properly, and that the public should not be compelled to receive this food as pure and good, simply because the man is imperfectly equipped.

2148. This excess of water in Irish butter goes up occasionally beyond 15 per cent., does it not?—Yes.

2149. To what percentage does it go up?—It goes up as high as 40 per cent. One of the witnesses in the court at Manchester said that he had himself had butter, or had seen butter, containing 40 per cent. That was an outside case, of course, but from 25 per cent. upwards to 28 and 29 per cent. is very common, and 21 and 22 per cent. they look upon as being quite normal.

2150. Does this excess of water occur in other samples of butter, such as Hamburg butter?—In Hamburg butter, unquestionably. In Hamburg there is known excess, because the people who send the butter to England from Hamburg are manufacturers or blenders on a large scale, who have every means of doing their work in a perfect manner, and that butter is sent to us improperly adulterated, really adulterated.

2151. Can you give us the opinion of Dr. Bell and others on this subject?—Dr. Bell, in his well-known work, says that more than 12 per cent. is unnecessary, and that over 16 per cent. is injurious to the keeping properties of butter; and yet I believe that Dr. Bell and his staff have been very commonly responsible for permitting this fraud to be continued by the mild manner in which they treat the analyses made by analysts in the country. If you take Duclaux as an example of French opinion, he takes 14 per cent., with a difference of 1 per cent. either way.

2152. And Fleischman?—Fleischman takes, for unwashed butter, 12 per cent., or for washed butter, 12½ per cent.

2153. Have you some analyses of butter of different countries with reference to this point?—Yes, I have them, both in brief and in extenso, of a large number of samples of English butter, taken from a very eminent man, Dr. Veith, who

Chairman—continued.

was for many years chemist to the Aylesbury Dairy Company. He shows that average English butter contains from 7·26 to 15·79 per cent. of water, averaging 11·12 per cent.; that 93 samples of French butter averaged 13·93 per cent., and a number of samples of French salt butter (the others being fresh butter) contained 12·5 per cent.; that of Danish butters the average was 13·24, and Australian 11·55.

2154. Then water can be removed below the limit of 15 per cent. by careful preparation?—Yes; for the evidence at Manchester I made an experiment. The butter was churned in two lots with an equal quantity of cream; the work was done the same in each case, excepting that in one case the brine used in washing and salting the butter was warmed; this being done because it is known that some manufacturers treat their butter with warm brine for the express purpose of enabling it to retain both salt and moisture. I think I have the exact figures. At all events, one sample contained between 8 and 9 per cent. of water, and the other one between 12 and 13 per cent.

2155. The one being treated with warm brine?—Yes, but even with warm brine (this is my point) the water was considerably less than 15 per cent.

2156. If they use warm brine to increase the percentage of water, how do they manage that absorption of water beyond the point to which you succeeded in obtaining it?—Simply, either by carelessness or by design. If to a very soft butter brine is added, you cannot work the butter on the machine, or by hand, or in any other way in order to remove the water; therefore the water is incorporated and sent out to the dealer.

2157. And the salt is not used to increase the percentage of water, is it?—In that case it is, because the salt assists in retaining the water itself. But in ordinary butter, it is contrary to what is generally supposed. I do not believe that salting does at all assist in retaining the natural moisture.

2158. This water is injurious in two ways; first of all, it is a fraud upon the purchaser, who buys water instead of butter?—Yes.

2159. And, secondly, it is injurious to the butter, inasmuch as it assists decomposition?—That is so in many cases. Pure spring water free from bacteria or organic matter is undoubtedly wholesome, and useful in making butter; but if water which is derived from shallow wells, or from cisterns, or from exposed running streams, for example, contains organic matter or bacteria (which it unquestionably does), then it is perfectly certain that butter deteriorates from the adoption of its use.

2160. Then water of an impure kind might in that way be the means of conveying disease?—It might be.

2161. I think there is also another reason, is there not, why they use this water and this salt; it is to cover the flavour of poor butter, or badly made butter?—That was stated in evidence in Manchester, although it was flatly contradicted, I believe, on the other side; but that is my experience. If you make butter of inferior

Chairman—continued.

quality, and unquestionably butter is of inferior quality, made, as it is, in cabins in County Kerry, where they have no proper convenience, that butter will not keep; it is only a matter of a few days to be off flavour. Then, in order to prevent the detection of this off flavour, this incipient rancidity, heavy salting is adopted, and the consumer does not detect it so fully.

2162. Butter then, may appear on the surface dry, may it not, and yet contain a considerable quantity of water?—Yes.

2163. How do you account for that?—I am afraid that I have forgotten to bring some photographs to illustrate my meaning; but this is the result of Danish experiments. The chemical adviser to the Danish Government on this question, Professor Storch, two years ago made some exhaustive experiments in order to ascertain the percentage of water in butter by the microscope. I happened to be over just about the time, and he showed me the photographs, which he subsequently sent me. He found upon an average of a number of samples, the presence of water was not actually owing to anything beyond carelessness in the manufacture. For example, an apparently dry butter was found on analysis to contain more moisture than it should do, and by the microscope it was found that this water was distributed very generally throughout it in minute globules, whereas another butter which appeared to be much wetter when examined by the eye, did contain less water, although the water was present in large globules, instead of being in small ones. This was owing to careless manipulation.

2164. That is to say, that in the one case the water was minutely divided and distributed through the mass, and in the other case it was aggregated into large globules?—A few large globules.

2165. The latter being the result of careless manufacture, and the other the result of what?—The result of excellent manufacture.

2166. Was the percentage of water unequal in these cases?—No, in the apparently dry butter it was higher, although not too high. I do not suggest that——

2167. It was higher?—Yes.

2168. But not beyond your standard of 15 per cent.?—No. In cutting the butter with a knife, a judge generally looks to see if there is water present, and he sometimes finds a drop exude, and he concludes that there is water in abundance, but it may be that this water may be present in large globules instead of very minute ones.

2169. So that a surface appearance of water does not enable you to say how much water there is in a butter?—Certainly not.

2170. I think that concludes all that you have to say upon this subject as regards water in butter?—Yes.

2171. Now about milk; do you think that milk should be placed under the same control of a central department of the Government as butter?—I think it should be included under the same heading; that there should be a Dairy Bureau or department somewhat of the character of the American Commission, and that milk should be included under its head.

2172. And

Chairman—continued.

2172. And you would allow consumers to send up samples of milk for analysis, as of butter, to that department?—Yes.

2173. You think that Section 25 of the Sale of Food and Drugs Act enables milk dealers to escape by the nature of its provisions?—Yes.

2174. Will you refer to that, if you please?—"If the defendant in any prosecution under this Act prove to the satisfaction of the justices or court that he had purchased the article in question as the same in nature, substance, and quality as that demanded of him by the prosecutor, and with a written warranty to that effect, that he had no reason to believe at the time when he sold it that the article was otherwise, and that he sold it in the same state as when he purchased it, he shall be discharged from the prosecution, but shall be liable to pay the costs incurred by the prosecutor, unless he shall have given due notice to him that he will rely on the above defence."

2175. Labels of that kind, you think, cover the milk dealers?—In many cases in my experience it has been insisted that the farmer or producer shall attach to the churn of milk which he sends by rail, a label which is worded and treated as a warranty, and that when a prosecution occurs this label has been taken into court, and has exonerated the person who has been charged.

2176. Would you alter that?—I think I would.

2177. In what way?—I do not think that it guarantees milk of a high quality, because, in the nature of things, a person who is absolved by somebody else is careless, and not so careful as he otherwise would be, in distributing to the public an article of very high quality.

2178. Would you proceed against the farmer through the retailer, as in the case of butter?—That is a point that I have not noted just here. I should like to add to my remark, also, that the milk, if it is in cans at the time it is seized, may be referred to as regards this label; yet if it is removed from the can, the label cannot be referred to at all as being in any form a guarantee.

2179. But those cans can be sampled during their transit?—Yes.

2180. So that the farmer is liable to inspection during the transit of his milk?—Until the milk is delivered. I think you cannot very well exonerate a farmer so long as the milk is in his churn, and has not been touched by the person to whom he has consigned it.

2181. Once delivered and removed from the churn, you cannot hold the farmer responsible?—I think not.

2182. The fines inflicted in these cases are generally too small, are they not?—I think so; they should be at least 5*l.* for the first case. I would be very liberal in drafting a law with regard to the adulteration of milk, but after having once convicted a man, I think he should be fined 5*l.*

2183. And afterwards, if he were repeatedly convicted, you would imprison him?—I would increase the fine to 10*l.* on the second occasion, and 50*l.* for the third, and then I would give him a taste of the law in another form.

Chairman—continued.

2184. By imprisonment, you mean?—Yes.

2185. Would you give farmers and dealers power to indict their own servants if they were guilty of fraudulent practices in connection with milk?—With regard to that point I should like to quote the proposed law drafted by the Dairy Trade and Can Protection Society. I know nothing about that society excepting that I have had this sent to me, but it is very full of common sense. "Any person who shall add water or other adulterant to, or abstract the fat from milk, the property of his employer, shall be liable to a penalty not exceeding 20*l.*, or to imprisonment without the option of a fine in addition to the value of the milk so damaged." And there is a further clause, "Where an employer is charged with an offence against this Act, he shall be entitled, upon information duly laid by him, to have any other person whom he charges as the actual offender brought before the court at the time appointed for hearing the charge, and if, after the commission of the offence has been proved, the employer proves to the satisfaction of the court that he had used due diligence to enforce the execution of this Act, and that the said other person had committed the offence in question without his knowledge, consent, or connivance, the said other person shall be summarily convicted of such offence, and the employer shall be exempt from any penalty."

2186. Do you think that farmers are liable to this kind of action very frequently on the part of their servants?—I do not think that farmers are very often liable to it, although I have known a case; but I think that people in the trade are. It is pretty well known to those in the trade that there is a great deal of fraud going on on the part of servants, both of the wholesale and the retail dealers and distributors, and that they require protection accordingly.

2187. Then you would have all the evaporated milk, or separated milk, labelled?—Yes. I think that it should be labelled in very large letters, in two-inch letters on every can.

2188. Separated milk; that is to say, might be sold as separated milk, but only as separated milk?—Yes, I have no objection to that; although, if my will could be law, I would not sell separated milk at all.

2189. Why?—Because I think it is very damaging to the trade of the country, and deleterious to the health of children, who are the very large consumers of it.

2190. That is to say, that it is not so nutritious for children as pure milk?—It is not so nutritious.

2191. But in itself it is not injurious?—By no means; it is an excellent food for stock on the farm; but I think that both condensed skim milk and separated milk are the means of a very great deal of fraud on the part of those who sell them, and do a great deal of damage to people who consume them.

2192. But do not you think that there is less damage done by separated milk and pure milk being mixed together than by water being added to pure milk?—That is another point; I quite agree to that.

2193. As regards colouring matter, you would

Chairman—continued.

prevent that being added to milk?—It is well known in the trade, particularly in London and large cities, that poor milk, that is to say, milk naturally poor, and bought at a low price, or good milk mixed with separated milk, is enriched in appearance by the addition of anatto. This is extremely common, and I think it should be penal to do it. It can easily be detected by an analyst, and I think it ought to be included in any future Bill.

2194. But at the same time, if that makes the milk pleasanter to the eye, and it is not injurious to the consumer, there is some advantage in a product of that kind being sold at a cheap price to the poor, is it not?—An advantage in colouring?

2195. I mean, if it is pleasanter to the eye it is probably pleasanter to the palate, to some extent?—I think it is pandering to the ignorance of the very lowest classes; and I believe that milk so highly coloured as it is sold very often is injurious.

Mr. *Bolitho.*

2196. Do not you think that a very large proportion of all the milk sold in London is so coloured?—I believe it is.

Mr. *Jeffreys.*

2197. You believe that it is coloured?—Yes.

2198. Coloured by the retailers, then, not by the farmers?—Yes, by the retailers.

Chairman.

2199. That is produced by the public taste, probably; there is a desire, is there not, for a rich-looking milk, on the part of the public?—I do not think so, at all.

2200. Why is it done, then?—It was done originally under a misapprehension, no doubt, by people with no conscience, and who supposed that they would be gratifying the consumers by giving them milk of the colour of the Jersey milk, which he never sees.

Mr. *Channing.*

2201. Does it not convey to the customer the idea that he is getting such milk in all cases?—It conveys to him the impression that he is getting a pure milk, but not an exceptionally rich milk.

Chairman.

2202. You think it conveys to him an idea that he is getting a better article than he would if it were not coloured?—Yes.

2203. Your proposal with reference to milk is, that there should be a standard fixed?—Yes.

2204. And that that standard should be fixed so that all milks falling below it would be regarded as adulterated?—I would not commit myself to use the word "adulterated" at this moment; but I would simply propose that there should be a standard.

Sir *Mark Stewart.*

2205. You could not make a standard for colour?—No, for fat.

Chairman.

2206. This is a standard of composition?—Yes.

2207. You propose that your standard should be what?—3·2 per cent. of fat, and 12 per cent. of total solids.

Mr. *Channing.*

2208. That is 8·8 per cent. of solids not fat?—No; my proposal is 3·2 of fat and 12 per cent. of total solids.

2209. That would leave 8·8 for the rest?—No; it is quite a different thing if you look at it in another way. I would have no standard of solids not fat at all.

2210. That is often referred to, is it not?—It is, but I do not think that it should be; and my reason is that there is a difference of opinion upon the point. There are some who wish to make a standard of 9 per cent., and although I am one of those who would like to make anything as high as possible consistently with what is fair to the public; I do not think it is possible, as a producer myself, to fix 9 per cent.; I am sure that you could not do it.

Chairman.

2211. Nine per cent., for what?—For solids not fat. I have abundant evidence on that, but there is evidence that you will have before you, I daresay, pressed as strongly as it can be pressed.

2212-13. Will you give us your evidence on that point?—This I take from one of the large milk companies in which the standard of fat is referred to. This gentleman, a director of this company, bases his figures upon a very large number of analyses, and he says in his contract, "or if it should be certified by the company's analyst for the time being that the milk supplied under this contract contains less than 3·25 of fat solids, or more than 9·20 of the other (non-fatty) solids, or less thereof than 8·75 during the months of June to March inclusive." Then he is at liberty to deal with this matter. Therefore this company require their milk to contain 3¼ per cent. of fatty solids and 8·75 per cent. of solids not fat. And further, and this is the point that I would like to impress upon the Committee, they require that the milk shall not contain more than 9·20 of non-fatty solids. I do not recommend that; it is impossible; but the point is this, that by the admixture of a certain proportion of separated milk with new milk you reduce the fatty solids and you increase the non-fatty solids.

2214. That is to say that you increase the non-fatty solids out of proportion to the normal quantity of fatty solids?—That is just the point; and, therefore, by maintaining a high standard of non-fatty solids you are really giving a premium to the system of mixing the two milks.

Mr. *Channing.*

2215. Do you approve of a minimum standard of non-fatty solids?—I should not object to 8·75, as suggested here, but I would prefer to have none at all; I think it would be fairer all round.

Chairman.

2216. You have got some other figures there which I should like the Committee to have, because

Chairman—continued.

because this is an important point?—That is a very important Scotch company; I will not give the names, but the whole of the papers are open to the Committee to see, but it will be understood that I do not give the names. This company in their contract require 3 per cent. of fat, but they also require 9 per cent. of solid not fat; and in writing to me the manager says, "during the last 10 years we have always stipulated for 3 per cent. of fat and we have had no trouble whatever in getting it." Then another very large and very well known firm gave me their percentage of fat, although they do not give it in sufficiently exact figures for me to quote it, for very obvious and politic reasons upon their part; but they do obtain a large quantity of their milk at as high as 4·25 per cent. of fat.

Sir *Mark Stewart.*

2217. Is that a Scotch company?—That is an English company. The next is a large English firm. I think I might mention the name in this case; I am not forbidden, to do so; it is Tisdall, of Holland Park. I have here an analysis of the milk of the firm for a whole year in order to be able to quote the quality in every month, because it is well knowu that the quality varies in the summer as compared with the winter; in spring and the early summer months milk is very often poor, comparatively, in fat, whereas in autumn, and early winter it is much richer. In this case there is only one single instance in which the fatty solids were below 3 per cent., and in this case the non-fatty solids were very high, and I have made a mark questioning its being of a genuine character. The same firm require their farmers to deliver all their milk with 3 per cent. of fatty solids; and I should also add, which is very important indeed, that the whole of these analyses (and there are a good many of them) are of the morning's milk, and I am told by the firm that the milk of the evening is generally as much as 1 per cent. higher; so that the average of this firm and others that I have quoted, would be considerably higher than 3 per cent.

2218. You give us all those analyses of different firms in support of your standard of 3 per cent. for fats, and a total of 12 per cent. for all solids?—Yes. This firm require their farmers to deliver milk of 3 per cent. and 12 per cent.

2219. You think that in all cases of the details analysis should be given to all people whose milk is sampled?—I think it should.

2220. For instance, if a churn is sampled in transit, the details of the analysis should be given to the farmer?—I think it should.

2221. And if milk is sampled and analysed during delivery to the customer by the retailer the same course should be pursued?—Yes.

2222. What is the New York system; what is their dairy commission; have you anything to say about that?—In New York State the law does not permit the sale of adulterated milk, which is described as follows: "(1) Milk containing more than 88 per centum of water or fluids; (2) Milk containing less than 12 per centum of milk solids; (3) Milk containing less than 3 per centum of fats; (4) Milk drawn from cows within 15 days before and 5 days after parturition; (5) Milk drawn from animals fed on distillery waste, or any substance in a state fermentation or putrefaction, or on any unhealthy foods; (6) Milk drawn from cows kept in a crowded or unhealthy condition; (7) Milk from which any part of the cream has been removed; (8) Milk which has been diluted with water or or any other fluid, or to which has been added, or into which has been introduced, any foreign substance whatever."

Sir *Mark Stewart*—continued.

2223. Do you agree with that as a definition of pure milk?—I accept that very fully indeed. I would not, of course, press the whole of these points upon the Committee.

2224. Is that New York State or New York?—That is New York State. There are in New York two authorities, the New York State Commission at work, and the New York Sanitary authorities. I went there, and was shown the whole of their system at work. The New York Sanitary Authorities have a standard of 12½ per cent. of total solids.

Chairman.

2225. Then the two bodies do not agree?—They did not; but they now work together very amicably. The Sanitary Department has divided the city into a number of districts; there are 6,580 persons registered as milk sellers, and each district is taken by an inspector, who reports from time to time upon the samples that he takes; and by this system they have been enabled to crush the sale of adulterated milk.

2226. In your experience would there be any hardship inflicted on the sellers of milk that might be pure, and which came from a poor cow, or a cow under circumstances which rendered its milk poor, and the milk not reaching that standard?—I think not, for this reason, not as regards a single cow, but dealing with milk in general, that the milk that we buy for consumption is not taken from a single cow, but from a number of cows.

2227. But it is conceiveable, is it not, that you might have in some districts a man with two or three cows only, and their milk not reaching this standard?—I do not think it is. I think it is conceiveable that one cow in three might give such poor milk, but I cannot think it conceiveable that three cows could possibly do so. I examined the books in New York State, and I added up a number of columns with the Commissioner taken at random, and the average of those columns was 4·2 per cent. of fat. Now we are certainly not unable to produce what the Americans can produce, and I think that what they find succeed should be found to succeed in this country just as well.

2228. Might you not have as this case for instance; you might have a cottager selling milk from a single cow; or there might be a number of people with three acres and one cow, and, if they sold milk to their neighbours, that milk, from time to time, would be below this standard,

Chairman—continued.

very possibly?—Yes. I would provide for that by tracing the milk back, in such cases, to the cow herself. It is quite possible, I do not know that I have any right to say so, but it is possible, nevertheless, for a cow with tuberculosis (I know it is with another disease) to give milk of abnormally poor quality, and I think that while a standard would assist in many other ways, it might in one way in particular, namely, by discovering those diseased cows.

2229. Still I am pointing out to you the difficulty with regard to a standard which has been raised more than once, and you think that it would be met by tracing the milk, in these individual cases, to the cow?—I think it would.

2230. Would you make that a valid plea against conviction?—Only in specific cases. I do not think it would be fair to allow any retailer of milk who is buying milk, or who is retailing milk from a number of cows, to make a plea of that kind; but I see no objection in the world to allowing any person selling milk from one or even two cows to make that plea.

Sir *Mark Stewart.*

2231. It would make a farmer very careful not to have these diseased cows in his herd, would it not, if he had to have a certain standard for all the milk sold by him?—Yes, it would. The farmer would be exempt, I am quite sure, from any probable conviction.

2232. Is it not the case very often now that a cow with tuberculosis will give an enormous quantity of milk?—Yes.

Mr. *Kearley.*

2233. You said that you could conceive of one cow in three giving this poor result, but you do not mean to take that as the average, do you?—No.

Chairman.

2234. But you would admit this, would you not, that a cow might be in a perfectly normal state of health, and yet give milk of a low quality below your standard?—I know it to be the fact, that she might. I can give you a case at the Royal Agricultural College.

2235. Could you give us the percentage; out of 100 cows how many would give milk below the standard that you specify?—I do not think it is possible; I do not think it has ever been done or attempted.

Mr. *Bolitho.*

2236. Must it not always very much depend upon the grass, and the season, and a hundred other things?—That is a debatable point whether feeding really affects the fatty properties in milk, or whether it does not.

2237. Do you not think, with your experience that if cows are moved from one field to another, very often in the course of two or three days there would be considerable shrinkage in the output of butter?—Yes; but it sometimes happens that that is owing to the shrinkage of milk.

Chairman.

2238. Have you any of Professor Veith's figures with reference to the analysis of milk upon which you could give us figures relating to the number of poor cows, or cows giving poor milk?—No; not with regard to poor milk. My figures have all been prepared with reference to milk of high quality. I have some more here that I should like to put in.

Mr. *Jeffreys.*

2239. Would it not be a very rare exception for any cow to give milk below the standard that you have mentioned of 12 per cent. of total solids?—No; it is not by any means rare. It is much more rare to find herds of cows giving milk below that standard, but not an individual cow. I will give you one or two instances to that effect. I have here the case of a very large Manchester firm where for four years in 42 sets of analyses in different months, the non-fatty solids were 22 times below 9 per cent., and 20 in number over 9 per cent. In every case with no exception during four years, in every month of the year the fatty solids of the milk were over 3 per cent., and in very many cases over 4 per cent.; I have here an average which I have got out from the records of our London Dairy Show for 1890, 1892, and 1893 for each breed. The non-fatty solids of the shorthorns was in each year below 9 per cent.: 8·78, 8·87, 8·91; the Jerseys were, in each case, over 9 per cent., the Guernseys the same; and the other breeds in two years were under 9 per cent., and in one year over 9 per cent. So that this evidence proves that it is impossible to insist upon 9 per cent., even with cattle of the very highest quality, fed for exhibition. At the same time, in every case the fatty solids were very high. Those are very valuable figures.

2240. Have you got the figures of the fatty solids in those cases?—Yes; they vary. As regards shorthorns, they were 4·05, 3·8, 3·96; the Jersey were all over 5 per cent., the Guernseys, over 4 per cent.; and the other breeds were, in two years, over 4 per cent., and in the third year 3·96. I have also data with regard to milk supplied to the British Dairy Institute. I am chairman of the committee, and these were given me by the director who buys milk from farmers in Buckinghamshire, near the institute, and in every case the fat during the past two months has been over 3·4 per cent. This evidence, again, is the fullest that I have ever seen; it is with regard to work conducted by the New York State experiment station during three years. I was at the station last year, and I obtained all their reports, and I worked them out into this table which I have here. In one year they made experiments in cheese-making at the station itself, and at a factory near the station. In the other years they made similar experiments at three factories, in one case dealing with 750 cows, in another case with 650 cows, and in the third case with 14,000 cows. I have got the figures not only with regard to the three years, but to all the seven cheese-making months. The lowest fatty per cent. in any month was 3·2 in May 1892; with regard to solids not fat, they were 10 times; that

Mr. *Jeffreys*—continued.

that is to say, in 10 months, over 9 per cent., and in 27 cases, under 9 per cent. Out of 36 months, therefore, there were nine months in which they were over 9 per cent. only. Then to compare with those, I took the experiments made in Somerset during the last two or three years in Cheddar cheese manufactore, where I found that, as regards English milk, we had as low as 3·06 per cent. of fat and never reaching 4 per cent. until the month of October; and with regard to solids not fat we had in Somerset, in every case, in April, May, June, July, and August, and in September of one year, under 9 per cent.; and in only three cases, September 1891, and October and September 1892, over 9 per cent. of solids not fat. These figures relate not merely to herds of cows, but to herds upon a fairly large scale.

Sir *Mark Stewart.*

2241. Have you any Scotch statistics upon the same subject?—Yes.

Chairman.

2242. Have you got statistics for the Scotch Dairy Institute?—Yes, but the dates are not so full. "The last analysis of the milk at school, which was taken on the 9th of July, showed 3·6 of fat."

Sir *Mark Stewart.*

2243. Is that at Kilmarnock?—Yes, from 40 cows at the Home farm. "This milk contains 8·7 of non-fatty solids. We also buy the milk of 28 cows for our school, a sample of which, analysed on the same date, showed 3·5 per cent. of fat, and in each case the samples were taken from the morning's milk," so that these figures really represent milk of a higher quality than the figures show.

Chairman.

2244. Have you any more evidence on that point that is worth putting in?—I will only give you two more cases, one as regards Ayrshire cows. In the first half of the year 1892 the total solids averaged 11·45 per cent.; and in the second half 12·13; and by the Babcock test the milk analysed as regards fat in 1893 in no case showed less than 3·25 per cent., and in 1894 in no case less than 3·34 per cent. These are all from Ayrshire cows of mixed morning's and evening's milk.

2245. All those figures that you have given us go to support your view that it would be proper and fair to have a standard of 3·2 per cent. for fats, and 12 per cent. for total solids?—Yes.

2246. Can you tell us what is the practice in Paris?—In Paris the municipal authorities adopt 13 per cent. of total solids as the basis for prosecution, and 4 per cent. of fat. I sent over to one of the professors the figures that I suggest to-day, and he says that the figures adopted, not merely adopted for calculation, but adopted for prosecutions, are practically the same 3·25, and 12·25 per cent.

2247. Do they use the same methods of analysis in Paris that we do here?—Yes.

Mr. *Kearley.*

2248. The Babcock test or the coil?—They use the recognised chemical system; but as regards the Parisian figures, I am bound to say they have no law upon the point of a standard, and that, so far as you can gather, it is practically left to the chemists themselves.

Chairman.

2249. And the standard there is in the same position as it is here?—Yes; but the professor uses the words very distinctly "practically the same"; not really the same.

2250. Is there a standard in Germany?—I cannot answer that question.

Mr. *Kearley.*

2251. Whose standard is that in France, that of the public analyst, or the Government?—It is really a standard of the chemists; there is no Government standard.

2252. But the Government chemist or the municipal chemist?—The municipal chemist.

Mr. *Herbert Gardner.*

2253. How are the prosecutions conducted?—I do not know.

Sir *Mark Stewart.*

2254. Is that a more correct test than Babcock's?—Babcock's is a ready test for farmers; it is perfectly correct for fat.

Chairman.

2255. Do you know anything about the Canadian or Copenhagen practice?—I have a note here to that effect. In Copenhagen, if a sample contains less than 3 per cent. of fat, it is taken again from the whole herd in the presence of a police functionary. There are no binding regulations as regards a standard of fat in Copenhagen.

2256. In regard to Canada, have you anything to say?—In Canada there is no standard; they adopted a method a year or two ago in order to ascertain what figure should be fixed in case they fixed a standard, and they obtained a very great number of samples, which analysed out to 12·48 per cent. as the average of total solids.

Mr. *Herbert Gardner.*

2257. Have you got the average of fat there?—No.

Chairman.

2258. Do you know what is the standard in Boston?—In Boston they adopt 13 per cent. of total solids. And this is rather a remarkable fact, that in 1883 the percentage of convictions with regard to the samples taken, which were found to be adulterated, was 60 per cent. In 1884 this had fallen to 40 per cent.; in 1885 to 30·6 per cent.; in 1886 to 18·55 per cent.; in 1887 to 12·54 per cent., and in 1888 to 8·59 per cent.

Mr. *Channing.*

2259. May we have your opinion as to whether that is from an ineffective use of the law, or the effective use of it?—From the effective use of it.

2260. You do not think that there are complaints of continued frauds which are neglected

Mr. *Channing*—continued.

by the authorities?—No, I do not think so. When I was there they took in one week 87 cases into court, and the large bulk of them were convicted. That only happens occasionally; they take a large batch at one time.

Sir *Mark Stewart.*

2261. What sort of fines are inflicted?—From 20 to 50 dollars.

Mr. *Kearley.*

2262. Do you attribute this diminution to the establishment of a standard?—Yes.

2263. I understand that the standard came into force in 1883 or 1884?—In 1883.

2264. The high figures were before the standard was established?—Yes.

Chairman.

2265. It is a high standard in Boston?—Yes.

2266. And that has had a good effect, you think, in the matter?—That is what the officials claim, and they impressed it upon my mind.

2267. Have you anything to say about the Belgian State Laboratory, and their methods?—I think not. They have simply a State Laboratory, and a system of inspection under the Government.

2268. Have you anything more to add on this portion of your evidence?—I do not think I have at the moment.

2269. You have nothing to say about a high and low standard; you would simply have the one standard?—I would simply have the one standard.

Mr. *Kearley.*

2270. In these districts where there is no law as to a standard, but where the municipalities establish one, is there any Government department that is constituted a court of appeal, supposing the vendor questions the accuracy of the municipal analysis?—I cannot answer that question, I am afraid, as regards any country.

2271. We have it of course, as you know, at Somerset House?—Yes.

Chairman.

2272. Then children's milk, bottled and preserved, you think, ought to be looked after very carefully?—It is pretty generally known that many of the small vendors of children's milk, who have no means of providing it, simply bottle a proportion of the ordinary milk that they receive from their farmers, and label it, and distribute it as specially bottled children's milk, and sometimes as from one cow. This might have been done many years ago when cows were kept in London, but it is impossible now. If your milk is not only mixed with water or separated milk or colouring matter, but with boracic acid and other preservatives, I think it is time that the law stepped in and checked this species of fraud.

2273. With regard to condensed milk, have you anything to say?—I have. I will hand you a number of labels taken from the tins of condensed milk (*handing in the same*).

2274. Is this milk skim milk in most cases?—In every case it is separated milk. Those labels

Chairman—continued.

are taken from tins which in many cases are below the weight; they are supposed to be a pound, 16 ozs.; and in very many cases they contain very much less fat than they ought to do.

Mr. *Whiteley.*

2275. Are they all foreign samples?—No; they are Irish, Dutch, Italian, and German.

Mr. *Herbert Gardner.*

2276. Are there no English establishments?—I have not one single brand of an English establishment.

Chairman.

2277. These tins, as a rule, contain a smaller proportion of fat than they ought to do, you say?—Yes, they do.

2278. Though in some cases they contain a larger amount of total solids?—I have not got the total solids in any analysis. The total solids would include the sugar which they add to the milk, of course.

2279. But if they are made of separated milk they contain a larger amount of solids not fat, do they not?—Yes.

2280. And that would account for some of them containing a larger number of solids?—Yes.

2281. Is there any preservative put into them except sugar?—I do not think so.

2282. Are there any English condensed milks?—Yes; the Anglo-Swiss Company at Aylesbury prepares some, I believe.

2283. Those are in your opinion better milks than some of the foreign brands?—I have an analysis of those; they are English and Swiss brands as well, and they are of very good quality.

Mr. *Whiteley.*

2284. There is a large company near Middlewich, is there not?—That is one of the Anglo-Swiss Company's establishments.

Chairman.

2285. You think that on these tins there ought to be the words "skim milk" very legibly and prominently placed?—I think that the label should be on the tins.

2286. You say in black or blue letters from half an inch to three-eighths of an inch in size?—Yes, I measured the exact figures, but I have mislaid my paper.

2287. But they ought to be larger, you think, than they are on the labels at present used?—Unquestionably.

2288. So as to warn the public what they are buying?—Yes. I think also they should show their source of origin, the milk of every country being shown from whence it comes.

Mr. *Herbert Gardner.*

2289. What would be the object of that?—For example, you have a label like this (*handing in a label*) on which you have a Swiss chalet with the Alps in the background and the trees of the country, and this is labelled "Swiss Dairy Brand."

Mr. *Herbert Gardner*—continued.

Brand." It is made in Ireland. The condensed milk, as regards the Swiss, has a very good name in this country; people all look for Swiss condensed milk, and although the company which makes it is not a Swiss company, still the people buying it think that they are buying the best Swiss condensed milk, which is really of a high quality and which is largely made in England; and although they put upon their English labels where it is made, still their brand is either the "Rose" brand, or the "Dairy Maid" brand, or something of that kind. But if you put on this Swiss chalet, with the mountains behind, I maintain that the public who are in the habit of buying milk of this kind, assume that it is of a high quality.

Mr. *Kearley.*

2290. What is the retail price of Anglo-Swiss milk, do you know, or Nestle's?—I do not know, but it varies from 4½*d.* to 6*d.*

2291. Would that be a high price?—Some skim milks are sold at a little less, but out of all proportion to their value. The condensed milk is only worth from ½*d.* to 5-8ths of a penny.

Mr. *Channing.*

2292. Is separated milk better than pure milk, and more easily treated than pure milk, for the production of condensed milk?—The system of treatment is almost identical. The only reason why separated milk is sold in this way is that it is a drug in the market, and that those people who have no outlet after making their butter, take their skim milk and adopt the plan because it is more profitable.

2293. The process for condensing would be the same in both cases?—Yes.

Mr. *Herbert Gardner.*

2294. Has this condensed skim milk any nutritive quality at all?—Unquestionably; but it is deprived of its fat, and being used for invalids and children largely, I contend that it is an improper thing to sell for what it is not.

Chairman.

2295. And you think that these labels ought not to contain directions for use?—Not when they recommend the milk as being valuable for infants and invalids; I think that is worse than penal.

2296. You think that in supplying a milk which does not contain the normal proportions of the nutritive qualities of good milk, the use of that milk is aggravated by their giving directions as if it did contain those qualities?—Certainly, because it misleads the poor people who are the chief buyers of it.

2297. And consequently leads them to bring up their children on an inferior article, using it as if it were a superior article?—Yes.

Mr. *Kearley.*

2298. Would your objection to skim milk be met were the words "skim milk" put upon the labels, so that they could be plainly seen, and if it were also stated that the milk was not fitted for the feeding of children?—That would meet

Mr. *Kearley*—continued.

my views certainly, but I should not like to propose it.

2299. I do not see why. I think it would be generally accepted by the manufacturers of condensed milk?—Looking at skim milk as a food, I take it that if you add any kind of fat, as the most intelligent people in the north do add chopped suet to skim milk in making puddings, then it is perfectly good, and I do not see but what it is almost as good as new milk; but if you deprive the milk of its fat, and then sell it to invalids and poor people, you are not assisting to improve their health, but to depreciate it.

2300. And your objection is that skim milk does get sold to people who are not acquainted with its properties, and feed their children upon it, and, consequently, do not give those children the proper nutriment?—Yes.

2301. That is the main objection?—Yes.

2302. And that the labels do not clearly declare that it is not full cream milk?—No.

Mr. *Whiteley.*

2303. Most of those labels do announce that it is skim milk, do they not?—Yes.

Mr. *Channing.*

2304. Would you state what proportion of these labels do state that they contain skim milk?—Nearly all of them: but my objection is that it is put in such small characters that it cannot be seen without examination in many cases. I think that it ought to state upon the face of the label that it is made from skim milk.

Mr. *Colman.*

2305. It seems rather the rule that in the majority of these cases they do not give any company or manufacturer?—Yes.

2306. The majority are without it?—Probably. I think the Irish people put on the name of the manufacturer, as a rule.

Chairman.

2307. Have you anything to say about the French manufacture of these articles?—Just this, that a year ago two manufacturers came to me with an introduction from Paris, and asked me if I could introduce them to some one in England and advise them as to the sale of this separated condensed milk in this country; and as they were introduced by a great personal friend of mine, who has treated me with great kindness, I did what I could. I took them to several large wholesale houses in the City of London, and I was as much interested as they were. The result was that they went back to Paris in great disgust because they could not obtain any possible prospect of a sale unless they could offer it to retail at 3*s.* a dozen tins; in fact, that was the price that was being paid by large London firms for some of the brands shown to us, and they could not see their way to take less than that.

Mr. *Jeffreys.*

2308. What is it sold at retail?—It is retailed at 3*d.* to 4*d.*

Mr. *Kearley.*

2309. Threepence a tin cost price?—Yes.

Mr. *Jeffreys.*

2310. And they retail it at what?—3½*d.* and 4*d.*; it is a very large profit, of course. These gentlemen expected to get something better than that, but they found that the market was full of nearly 40 brands of this milk, and therefore they gave it up as a bad job.

Chairman.

2311. Have you anything more to say upon this subject?—I have the analyses and the weights of the tins of several of these brands; I will simply refer to the figures without the names. One brand contains 2·25 per cent. of fat. I should tell you that the best brands contain from 10·28 to 11·95 per cent. of fat; but the other brands contain 2·25, 1·96, 1·63, 1·54, 2·33, 2·72, 4·91, and 6·18 per cent.

2312. So that they are all very much below the proper standard?—With one exception, every one contains much less than half the fat that it should do, so far as these cases are concerned.

Sir *Mark Stewart.*

2313. What quantity is there in each tin?—There should be 16 ounces; but they vary from 14½ ounces upwards.

Mr. *Kearley.*

2314. But are they sold as pounds of milk or tins?—As tins.

2315. They are not sold as pounds?—No; that is the point; but the pound is the idea that the buyer has, in consequence of the milk being introduced originally by the pound.

2316. Are the 14-ounce tins sold at the same price as the 16-ounce tins?—Yes. Recently, within the last few months, there has been a smaller tin introduced of a different shape; but that is sold, I think, for 1½*d.*

2317. They are all sold by the tin?—Yes.

2318. But I think some of the Swiss firms guarantee the weight; they guarantee that a tin contains so much net weight?—The best firms do.

Wednesday, 25th July 1894.

MEMBERS PRESENT:

Colonel Bagot.
Mr. Dunbar Barton.
Mr. Channing.
Mr. Colman.
Mr. Colston.
Sir Walter Foster.
Mr. Frederick Frye.
Mr. Herbert Gardner.
Mr. Jeffreys.
Mr. Kilbride.
Sir Mark Stewart.
Mr. Whiteley.
Mr. Yerburgh.

SIR WALTER FOSTER, IN THE CHAIR.

Mr. CHRISTOPHER MIDDLETON, called in; and Examined.

Chairman.

2319. I THINK you are a large practical agriculturist in Yorkshire?—Yes, I am a dairy farmer in Yorkshire.

2320. Do you farm many acres of land?—Between 300 and 400 acres.

2321. And you have given, have you not, a great deal of attention to the question of margarine and milk, that is to say, margarine as an article of commerce, and milk as an article of food?—Principally to milk as a produce, and to some extent to margarine, because adulteration by it injures our position as dairy farmers.

2322. And your interest in margarine is simply the interest of a dairy farmer who wishes to legitimately protect his own production?—Principally to protect my own industry, and, to a certain extent, to protect the public.

2323. In what way would you propose to interfere with the present sale of margarine for that purpose?—The first thing would be to prohibit any colouring matter being allowed to be added to margarine.

2324. So that margarine would come into the market in a paler condition, its natural colour?—In its natural colour.

2325. And consequently it could not possibly be mistaken for butter?—That is so.

2326. You do not propose that there should be any foreign colouring matter of a different colour from that of butter added to margarine?—I am not in favour of that.

2327. You would simply require that it should be introduced into the market in its natural condition?—That is so.

2328. That you think would be an effective protection to butter producers?—I think in nearly every case that would make it absolutely impossible for margarine to be substituted for butter.

2329. In addition to that you would have, would you not, travelling inspectors from the central authority?—Yes; to go down where the local authority are not doing their duty; that is to say that these travelling inspectors should go down and do the work that the local authority neglect to do; and also that there should be inspectors at every port where margarine or butter is admitted.

Chairman—continued.

2330. Then you would have these inspectors to look after the margarine and butter as imported, and also to go about the country taking specimens?—Yes.

2331. And seeing that the Act was thoroughly enforced?—Yes.

2332. What, in your opinion, would be the effect of this prohibition as to the colouring of margarine; would it tend to raise the price of food for the poorer class of people?—No; my opinion is that it would raise the price of butter, and that it would lower the price of margarine. Poor people, who prefer to use margarine, at least who can only afford to use margarine, would get it then at its true value, and they would reap the benefit of that.

2333. Do you think, then, food would be as agreeable and pleasant to them in the form in which you propose that it should be used as it is at present?—I do not think there is very much sentiment amongst that class of people who would buy margarine as margarine; I do not think that they would mind very much what colour it was.

2334. Then you would also extend your inspection and prohibitive measures to hotels and restaurants, I believe?—To restaurants, certainly, and as far as possible to hotels.

2335. With a view of preventing their giving to their customers margarine instead of butter?—Decidedly. There is this difference between hotels and restaurants. At an hotel you do not perhaps specifically ask for butter, or if you do you are not specifically charged for butter. At a restaurant, I think, the Act as it stands, if properly enforced, would meet the case, because there you ask for butter, and in many restaurants there is a special charge made for butter if you have it; and there the present Act, if enforced, would meet the case,

Mr. *Channing.*

2336. It would be a distinct misrepresentation?—In that case it is decidedly a misrepresentation.

Chairman.

2337. You would also have all wholesale margarine manufactories and the stores of wholesale dealers inspected?—Certainly.

2338. And you think that this inspection of those stores would be a valuable protection to the public?—If it was thoroughly carried out.

2339. Would it prevent adulteration?—To a very great extent.

2340. By preventing the substitution and misrepresentation of the article sold?—Yes.

Mr. *Whiteley.*

2341. Are not those manufactories chiefly abroad?—A great many of them are, but there are a certain number in Great Britain. I cannot give you the exact number now, but there are getting on to 20.

Chairman.

2342. You would further have all vendors of margarine registered?—Yes.

2343. So that everyone would know where a margarine manufactory was, or a margarine manufacturer resided?—Yes; that the inspector should be able to put his hand on them at once.

2344. Further, you would prevent margarine and butter being sold from the same counters?—Yes.

2345. You would have a separate department, practically, in each shop, one side of which would be for margarine, and the other side for butter?—Yes; there would be less opportunity for the one being given for the other in mistake.

Mr. *Frye.*

2346. I suppose you would increase the size of the shop at the same time?—If necessary to do so.

Chairman.

2347. You would also further have all specimens of margarine, or all specimens of margarine-butter, if I may use the term, invoiced as margarine?—If there was any admixture of margarine at all, I should certainly have them invoiced as margarine.

2348. You say any admixture; what do you mean by that?—If there is any admixture of margarine in any sample of butter it should be sold as margarine.

Mr. *Channing.*

2349. That is the law under the Margarine Act, is it not?—I have not a copy of the Margarine Act by me; I cannot say off-hand.

Mr. *Frye.*

2350. But you know that mixtures of margarine and butter have to be sold as margarine and not as mixtures?—That may be the law, but it is not the practice.

Chairman.

2351. Then in cases where the retail vendor proved that he had sold margarine or a mixture of margarine and butter instead of butter unwittingly, you would allow that to be a valid defence?—Provided that the original vendor is proceeded against.

2352. That is to say?—The wholesale dealer; the man he bought it from. Unfortunately if that defence is set up, very often the proceedings lapse, and go no further.

2353. In the Associated Chambers of Agriculture they do allow 6 per cent. of margarine to be mixed with butter; would you go further than they do?—I suppose that is really because below that percentage it is almost impossible to detect any admixture. I think that that is the reason that the 6 per cent. is allowed.

2354. Do you propose to go further than they do, or do you propose to take their standard?—I would go no further. If he could be detected I would not allow even 6 per cent.

Mr. *Channing.*

2355. Is not this recommendation of the Chamber of Agriculture based on the fact that 6 per cent. of butter is the minimum quantity which is necessary to manipulate into the margarine, to make it saleable at all?—Partly so; but I think it is partly because any lower percentage cannot be detected.

Chairman.

2356. Now about milk; you would have all premises where milk is produced for sale thoroughly inspected by the local authority?—Yes. To a certain extent this is done, but it is carried out in a most perfunctory manner.

2357. That would add a good deal to the duties of the inspectors, would it not?—If they were to carry it out very thoroughly it would, because at present they make next to no inspection.

2358. But you want a thorough inspection of every dairy shop and dairy premises made from time to time by the local authority?—Yes, and it is desirable in the interests of the trade that it should be done.

2359. Will you explain how it is desirable in the interests of the trade?—In the first place as a matter of public health it is desirable, because if that inspection was thorough there would be less likelihood of the milk being tampered with at the source where it is produced.

2360. How would the inspection of the shop interfere with the milk being tampered with, either by the farmer or by some wholesale dealer who distributed it to the shops?—I think in the case of the farmer if he thought that he was liable to an inspector dropping in at any moment it would tend to check it where it is done on the farm.

Mr. *Frye.*

2361. But milk could be watered in the street, could it not?—I suppose it is done occasionally in the street, perhaps not exactly in the street, but the man would go up a court, and I have seen it done, and bring it back with water in it.

2362. In

Chairman.

2362. In addition to this systematic and thorough inspection, you would have all people who are milk carriers and sellers of milk licensed?—Yes.

2363. Like the sellers of beer?—Yes. I think that as a rule the greatest adulteration is practised by those irresponsible milk carriers, men not representing large dairymen, but people who buy and sell a few gallons of milk in the day. Perhaps they have a small greengrocers' shop, or sell firewood, and they do not care for the profit that they make on the milk that they sell, because it brings people to their shop.

2364. It is for the convenience of their customers?—They are the people principally, I think, who buy this milk which is mixed with skim milk. I think the readiest market for that is found amongst that class of dealer.

2365. Smaller traders?—Yes, who are not dairymen.

2366. Each of those persons you would compel to take out a licence to sell milk?—I would scarcely go so far as to say that they should take out a licence, but they should be registered.

2367. And every person who carried milk about in the street would in the same way be registered?—Yes.

2368. And probably have a badge?—He should be able to show that he is registered when called upon to do so.

2369. And, of course, any misconduct on his part in the way of interfering with his wares, or his milk, would bring about a loss of his licence, or his registration certificate?—After repeated offences it certainly should do.

2370. And in that way you think you would get a better class of men, a more trustworthy class of persons to distribute milk?—Yes, I think so.

2371. There is a good deal of difficulty felt by many persons with reference to the standard of milk; have you anything to say on that point?—Yes; practically the whole question resolves itself into a standard.

2372. You are in favour of fixing a standard?—I think it is desirable that there should be a fixed standard. Seeing that there is a standard adopted, I think you should have a fixed standard, so that every one should know exactly what that standard is.

2373. Do you think that people could agree upon a standard?—I think that some agreement might be come to; it is rather difficult, but it is desirable that a standard should be fixed as high as it possibly can be, consistently with not being able to injure the honest producers of milk.

2374. That is a very difficult point to fix, is it not?—It is; there is great difficulty in doing that.

2375. That is to say, it would be very hard upon a small producer of milk, keeping one or two cows, who might not be able to attain to that standard, whereas a large producer, selling the milk of many cows mixed together, is able to attain to the standard?—Not in all cases. One reason why a hardship may come in, whatever standard is fixed, is that, as a rule, the inspector always takes the sample of milk from

Chairman—continued.

the morning's milk. There is very great variation in most cases between the morning's milk and the afternoon's milk.

2376. Where do you mean that the inspector does that?—In every town; in London, and elsewhere, he takes the morning's milk.

Mr. *Herbert Gardner.*

2377. Does it follow that because he goes in the morning to take the sample, it is the morning's milk?—In London the sample that is taken is really the previous evening's milk. That is one reason, I believe, why the milk supply of London comes out so well as it does, and many people form the opinion that the quality of milk is higher than it actually is.

2378. Where do you get the information that the inspector always takes it in the morning; we have received information from the Local Government Board quite the reverse?—I have a good deal of knowledge of dairymen in London. I am interested in the dairy industry in London, and I know, as a matter of fact, from the people whom I have to deal with, that the samples are nearly always taken in the morning; at least, so far as I know, the samples that have been taken from the company in which I am interested are in nearly every case taken in the morning.

Chairman.

2379. But that milk, you admit, of which a specimen is taken in the morning in London is the milk of the previous evening?—I believe that is one reason why many people think that the standard may be fixed somewhat higher than it really should be.

Mr. *Jeffreys.*

2380. Because the evening's milk is richer than the morning's?—In nearly every case; in some cases very much richer. I have some figures which I shall submit further on to prove that contention.

Mr. *Channing.*

2381. Are you referring to milk brought by rail to London, or milk from cows in London, or the neighbourhood of London?—I suppose the great proportion of milk that is sold in London is brought by rail.

2382. So that the inspector has no very tangible evidence as to when the milk was actually got?—No; but you may take it as a matter of fact that most of the morning's milk that is sold is the previous evening's milk.

Chairman.

2383. You say that you have some evidence bearing upon this point; will you kindly give it us?—I have here analyses made from the milk of my own cows. I had every cow in my house tested morning and afternoon one day last spring. In the case of very few cows did the fat come up to 3 per cent. in the morning.

Sir *Mark Stewart.*

2384. How many cows were there?—Forty cows in that house.

Chairman.

2385. Those experiments have been made on 40 cows?—Yes.

2386. Last March?—Yes; they were made on the 29th of last March. The average quality of the milk from those 40 cows in the morning was 2·86 of fat. In the afternoon milk the fat was 3·68, making the average of morning and afternoon's milk 3·27.

Mr. *Channing.*

2387. Over how long a time was this average taken?—It was just one day's milk.

Chairman.

2388. How were those cows fed during the previous 12 hours?—Those cows were highly fed; they were all in very good condition indeed; they were on winter feed entirely; they were kept in the house altogether.

2389. They were in the house the whole time?—Yes. They were receiving 2½ lbs. of decorticated cotton cake meal, 2½ lbs. of pea meal, 2½ lbs. of malt culm, 2½ lbs. of bran, that is, 10 lbs. of meal; they were receiving 80 lbs. of pulped roots, 10 lbs. of chaffed oat straw, and 7 lbs. of long hay. I have submitted that ration to feeding experts, and they tell me that the albumenoid ratio in that food is too high, and that it is a more concentrated ration that is recommended in any case as the correct ration.

Sir *Mark Stewart.*

2390. What sort of cows were they?—Unpedigreed shorthorns. I have some analyses taken on the same day of milk of Guernsey cows, which are very much higher.

Chairman.

2391. Is this a day's fodder?—Yes.

Mr. *Channing.*

2392. Is this a day's fodder for one cow, 80 lbs. of pulped roots?—Yes. A cow would eat nearly double that quantity if she were allowed as many as she would take. These are large-framed cows, which I am speaking of.

Chairman.

2393. The total solids in your milk for this single day's experiment were, on an average, 11·96 per cent?—11·96.

2394. You did not extend those experiments beyond one day?—A fortnight after, I reduced the quantity of roots, and I tested certain selected cows, those whose milk was the poorest of the 40; there was some increase in the fat and in the solids after a portion of the roots were discontinued.

2395. Then these experiments of yours were made really with respect to the effect of feeding?—Yes. Then on the 10th and 11th of this month I had further samples taken from the milk of the same cows; I did not take each individual cow's milk, but only an average sample from the bulk of the milk from all those cows, and there is an even greater discrepancy then between the morning's and afternoon's milk. These cows at the time were living on grass alone, without any extra food.

Colonel *Bagot.*

2396. They were out then?—Yes, they were out then, and getting nothing but grass.

Sir *Mark Stewart.*

2397. The same number of cows?—Yes; and practically the same cows most of them.

2398. When did they calve?—At all periods of the year; they are calving every week. I have here a table showing the number of weeks that each cow had been in milk, and the quantity of milk that she was giving each day.

2399. But the majority of those cows must have been giving full milk?—They were in every stage of milking.

Chairman.

2400. Well, tell us the result of your experiments now, if you please?—On the 10th of July the morning's milk showed 3·25 per cent. of fat, and the afternoon's milk 4·57 per cent.; the average of that day was 3·91 per cent. of fats. On the next day, on the 11th of July, the morning's milk only showed 3·09 per cent. of fat, but in the afternoon it was up to 4·70 per cent., bringing the average to 3·90 per cent., which is practically the average of the preceding day.

Mr. *Herbert Gardner.*

2401. Do not you think that these averages would have been more satisfactory if they had been extended over a lengthened period showing how much they varied?—I thought that taking two days, one after the other, it would fairly represent the composition of the milk at this period of the year.

Mr. *Channing.*

2402. That was done by the same analyst of course?—Yes; most of these samples were taken by the analyst himself.

Sir *Mark Stewart.*

2403. Was the weather the same?—Practically the same; I do not know that there was any change in the weather to account for the difference in these two days' milk.

Chairman.

2404. Then you put in these figures merely for the purpose of showing that on certain selected days your cows gave very different milk in the morning from what they gave in the evening?—And also to show that well-fed cows can give milk which does not come up in the morning to the recognised standard.

Mr. *Jeffreys.*

2405. What were the total solids on July the 10th?—12·52 per cent.

Chairman.

2406. Have you anything else to say about this?—Yes. If possible, I think it would be desirable that the inspector should take a sample at each end of the day, if he could be sure that it was the same dairy milk that he was taking it from.

2407. But the inspector going round the town could have no knowledge of the dairies from which

Chairman—continued.

which the milk came?—That would be rather difficult. There is one way to get out of the difficulty. In every case where a farmer is prosecuted for selling milk below the standard, surely if the magistrate has any reasonable doubt of the *bona fides* of the farmer, he should allow an appeal to the cow.

Mr. *Frye.*

2408. Take a sample from the cow, do you mean?—Yes, have a sample taken from the cow, and if it were proved that it corresponded with the milk on which the proceedings were taken, then, even if it came below any standard which may be fixed, the farmer should not be liable.

Chairman.

2409. Then it would be easy for an intelligent farmer to have a cow always ready that gave a very poor quality of milk, would it not?—The inspector should take a sample from the mixed milk of all the cows in the dairy.

Mr. *Frye.*

2410. But you said just now that they varied so much every day?—They do more or less, but still they would not vary to that extent. I think it would be quite safe to allow that, unless it was so very near the standard that a point or two would make the difference.

Chairman.

2411. Would not this condition of things be very difficult to enforce with reference to people keeping one or two cows. These difficulties that you point out with reference to large dairies, in the difference of the milk of the morning and the evening, would apply also to vendors of milk who have one or two cows only, and those cows might be yielding milk which, without being of very poor quality, would be below your standard?—It is quite possible.

2412. And it would be very hard upon him to prosecute him for selling an adulterated article when he was selling a genuine article?—I want to avoid that difficulty. If he has only one or two cows, and he appeals to the cows, and it is proved that the milk is given as he sold it, that man should be discharged from the prosecution, whether he be a small or a large farmer.

2413. In the case of a small man it would be more easy to make an appeal than in the case of a large farmer, would it not?—It is an easy matter, in the case of a large herd, to take a little out of each churn of milk.

2414. But the system of appealing to the cow, you think, would be fair to the large dealer, and to the small dealer?—I think it would be equally fair to the man who kept a single cow, as to the man who kept a hundred. If that appeal was allowed you might safely fix the standard higher than you otherwise could without it.

2415. It would complicate considerably, would it not, the proceedings in all those cases?—At the same time, it would protect the honest man from being branded as a rogue.

Mr. *Herbert Gardner.*

2416. It might be a matter of great expense to the small man, might it not?—If the appeal to the cow bore out the farmer, the prosecutor should be at the expense.

Chairman.

2417. It would fall on the local authority, that is to say?—Yes.

Mr. *Frye.*

2418. But different breeds of cows give different qualities of milk?—Yes. I have some figures from Guernsey cows, taken on the same day as I took the other.

Chairman.

2419. Will you give us those figures now?—In the morning the solid fats of the Guernsey cows was 4·57 per cent., and in the afternoon it was 5·30 per cent.

Mr. *Channing.*

2420. How many cows?—Eleven Guernsey cows. The average of that was 4·94 per cent.

Chairman.

2421. That was the average of fatty solids?—Yes.

2422. What were the total solids?—14·51 per cent.

Mr. *Colston.*

2423. Have you there the figures with regard to those cows in the summer as well?—No, I did not think it necessary to take them. I may say that these Guernsey cows were fed on exactly the same ration as the short-horn cows—at least a proportional ration; they did not eat so much of it; they ate as much as they liked, but they had the same mixture.

2424. Would they eat two-thirds of what the others did?—Practically, they did eat two-thirds of what the others did.

Chairman.

2425. And their milk shows the same variation as you have contended is shown between the morning's and afternoon's milk?—Yes.

Mr. *Herbert Gardner.*

2426. I do not know whether the question of separated milk arose before I came into the room; have you given any evidence as to that?—No. I was not asked any question with regard to that.

2427. With regard to separated milk, do you consider that it is an article which ought not to be sold at all?—No, I think it ought to be sold, but it should be sold for what it is.

2428. And you would object to any mixture being made of separated milk with the full milk?—I most strongly object to any mixture at all.

2429. Are you aware whether at the present moment any mixtures are sold as mixtures by the milk producers?—I believe it is done to a very great extent indeed.

2430. Knowingly done?—I may say that I know it is done.

Mr. *Herbert Gardner*—continued.

2431. But the purchaser knows, does he not, that he is buying a mixture of that description?—No, the purchaser does not know it; he expects that he is buying whole milk.

2432. Are you not aware at all that there are cases of institutions and others who wish to buy a cheaper article, and ask the dairies to accommodate them with that cheaper article, a proportion of separated milk being mixed with the ordinary milk?—I know that a great many people demand milk at such a price that, if they would only think of it, they would know that they could not get whole milk at that price.

2433. Are you aware that they know what they are getting?—I will not say that there may not be a case of one or two institutions that do it. In that case I would prohibit it altogether. They could buy the whole milk and separated milk and mix it at home.

2434. I am entirely at one with you as to not selling separated milk as ordinary milk; but do not you think it would be possible that if a certain standard of fatty solids was taken and the milk was sold in proportion to the fatty solids present in the milk, you might have a first-class milk which would be the ordinary unskimmed milk which might be sold as first-class milk, and then people who wished to buy cheaper milk might say that they would be prepared to give a less price if the fatty solids were present in a less degree and so on, down to ordinary separated milk; would you have any objection to that if it was known to the purchaser what he was buying?—I think if that was allowed it would tend to increase the practice of adulteration instead of checking it, as we want to do.

2435. But if the purchaser were aware of what is going on, would you have any objection?—I would rather that he should mix it himself. I would prevent the admixture altogether, with a view to prevent adulteration. I think it better not to allow the mixture to be sold as a mixture.

2436. But if the seller was under a penalty if he did not sell up to the amount of fatty solids that he guaranteed and the purchaser knew what he was buying, what objection would you have to that?—I think it is complicating the case and making it easier for adulteration to be carried on.

Mr. *Jeffreys.*

2437. With regard to what Mr. Gardner asked you, would it not be almost impossible to have this graduated scale unless you have an analyst attached to every shop that sold this milk?—It seems to me to be almost unworkable.

2438. Apart from that, it is a very ordinary practice, is it not, with the dairies selling nothing but Guernsey milk to get a higher price than when they sell shorthorn milk?—In my own case I get a higher price, and the dairyman who sells the milk gets an extra penny a quart for it.

2439. With regard to the amount of solids in milk, you have told us that your cows in March gave solids 11·96 per cent.; that was with very high feeding?—Yes, with the feeding which I have described.

2440. Supposing that those cows had been fed on brewers' grains, and such like things, instead of the long hay and decorticated cake, of course the milk would have been of a much lower standard?—The effect of the change of food had less difference on the quality of the milk than I expected, because previous to this from time to time the chemist at the dairy which receives this milk had week by week taken samples, and we found that it was not coming up to the recognised standard, and I have made several changes in my feeding with a view to improving it, but I have been able to make very little difference by any change that I could make in the food.

Mr. *Jeffreys*—continued.

2441. Then your cows must have been very good, I imagine. But take the case of a small man who could not afford to feed with that long hay that you described and 2½ lbs. of decorticated cake. If he were to feed instead with brewers' grains and such like things, his standard of milk would be very much lower than yours?—It would be lower.

2442. Then you would not prosecute that man for selling that milk, would you?—If an appeal was allowed to the cows, and the cows found to be improperly fed, I cannot say that I would allow that to be a good defence. I should say that it is a form of adulteration.

2443. But I thought you said just now that if it could be proved that the milk, however low the standard, came direct from the cow, in that case you would not prosecute?—I intended to imply from cows, fairly fed and in fair condition. I do not say that in the case of cows exceptionally badly fed or exceptionally poor that defence should be valid altogether.

2444. Then that would add another difficulty, would it not; because if it was proved that the milk was poor and yet came from the cow, you would have to call in evidence to show whether the cow was properly fed or not?—There are cases where cows are fed so that their milk should not be allowed to be sold as it is. That wants checking.

Mr. *Herbert Gardner.*

2445. It might be mixed with richer milk of other cows, so as to bring it up at the last moment?—Yes.

Mr. *Jeffreys.*

2446. It would be rather hard upon a man not to let him sell his milk at all because he has not a cow with rich milk, would it not?—It is only in the case of extremely bad feeding or poverty, where that defence should not be a valid one.

2447. You did not tell us, I think, what you thought ought to be the milk standard?—It depends to a certain extent as to what protection will be given. If the protection that I ask for should be allowed, say an appeal to the cow or any system of putting in as proof the composition of the morning's and afternoon's milk, I should go for a higher standard than I would do without those safeguards.

Mr. *Frye.*

2448. You are in favour of making the standard higher rather than lower?—As high as you can do safely. Am I to say what standard I recommend?

2449. Yes?

Chairman.

2449. Yes?—With the safeguard that I suggest. I would recommend a standard of 3 for fat and 8·50 for solids not fat.

Mr. *Whiteley.*

2450. With an appeal to the cow?—Yes. Without that standard I should only recommend 2·75 for fat and 8·50 for other solids.

Sir *Mark Stewart.*

2451. What are the total solids?—In the one case 11·25, and in the other case 11·50 per cent.; with an appeal 11·50; without an appeal 11·25.

Mr. *Herbert Gardner.*

2452. The same standard all the year round?—It would be difficult to fix a standard for different periods, because in different parts of England the months in which cattle are out at grass, of course, vary very much.

Mr. *Jeffreys.*

2453. I think you said that the shops where milk is sold ought to be registered?—Yes.

2454. Would there not be some difficulty in registering shops merely for the sale of milk as compared with other articles?—I suppose that there are different trades for which you can make special regulations; and a great deal of milk is sold from shops that it should not be sold from, and where I should like to stop the sale.

2455. Do not you think there would be rather a practical difficulty in this way; that if you precluded certain shops from selling anything but milk, on the other hand you would have to extend that and preclude other shops from selling anything but meat?—I do not ask that; I only ask that any shop that sells milk should be registered, not exclusively as a milk-selling shop, but as milk being sold from that shop.

2456. Have you ever considered whether the condensed milk which is brought over here and mixed with skim milk is sold as fresh milk?—I have reason to believe that it is done; I have no facts within my own knowledge.

2457. Do you know whether skim milk, for instance, is coloured and sold as fresh milk?—I believe that it is done.

2458. To any large extent?—I believe to a large extent, in London especially.

2459. And you think that if there were more inspectors that ought to be obviated?—I do not know that it would be necessary to have more inspectors, but there ought to be more inspection and more samples taken than there are.

2460. I thought you said that one thing which you advocated was more inspectors and travelling inspectors to test the milk?—There should be travelling inspectors who should go down to localities where the local inspectors are not doing their duty, and be sent to any place where it was found necessary to have more inspection.

2461. Are you acquainted with the adulteration of cream?—I have no facts to give you as to that.

2462. You do not know about the cream that is sold in London?—I have no evidence to give on that point.

Mr. *Jeffreys*—continued.

2463. With regard to margarine, you were asked the question as to whether if it were not allowed to be mixed with butter it would not increase the price to the poor people; what you meant I think was that this mixture was sold at a very much higher price than it ought to be?—It is sold as butter, and at the price of butter very often. If it were sold as margarine it would be sold at a lower price than it is actually sold at now.

2464. If a pound of butter costs 1*s.* and a pound of margarine 4*d.*, the mixture should be sold at 8*d.*?—I would not allow of mixture; I would sell the butter at 1*s.* a pound and the margarine at 4*d.*, whereas probably they are both being sold at 10*d.* They are getting 1*s.* 8*d.* for the two pounds, whereas it would only realise 1*s.* 4*d.*

2465. Then you would advocate what we have been told is the practice in Denmark; that is to say, that the people buy the margarine and butter separately and mix it themselves; it should not be allowed to be mixed in the shop, in your opinion?—Unless it is sold as margarine. I would not allow any mixture to be sold as any other than margarine; I think there are blended butters sold as such.

2466. Are you acquainted at all with the composition of the butter that comes from Normandy and Brittany?—I believe a great deal of it is mixed with margarine.

2467. You have got no particular evidence as to that?—I have no actual facts to bear that out.

Mr. *Channing.*

2468. I should like to ask you this: when you took the average of the morning and evening milk of the 11 Guernsey cows, what period of the year was it?—March 29th.

2469. And you have not tested them again in July?—No.

2470. Can you form any impression as to whether they would have improved in the same ratio as the other set of cows did?—I have every reason to think that they had, judging by the appearance of the milk if it stands.

2471. So that you would think that their figures, if they were analysed now, would probably come out better than even this analysis that you have given us?—I think they would have risen in the same proportion as the milk of the other cows.

2472. Did I correctly understand you to say that the fair standard in your opinion of total solids would be 11·25 per cent. without appeal to the cow, and 11·50 per cent. with an appeal to the cow?—I think 11·25 per cent. would be as far as it would be safe to go without an appeal to the cow.

2473. About this appeal to the cow, do you think that in practice there would not be a great many opportunities for fraud upon the part of the owner of the cow?—I do not think it would be possible, because the appeal would have to take place so soon after the other milking, that any change which he could have made in the food would not make any difference in the few days.

Mr. *Frye.*

2474. He might change the cow?—In the case of a single cow he might, but in the case of a number of cows he could not.

Mr. *Channing.*

2475. That would be a question arising rather between the farmer and the wholesale milk dealer in London, would it not?—It could only arise in a case where the farmer is summoned.

2476. It would be impossible to have an appeal to the cow as to London milk, would it not, in the case of a prosecution for London milk?—The farmer would not mind about an appeal to the cow if he was not the man prosecuted. If it was the dairyman who was prosecuted, it would not matter to the farmer.

2477. What was the method of analysis that was used for these cows of yours?—They were done by a practical chemist, the man who is retained by the company who takes my milk, for the sole purpose of making analyses of the milk. He is a specialist, and he does nothing else but make analyses of milk.

2478. He is the chemist of the company to whom you supplied the milk?—Yes. I may say that from time to time his analyses have been checked by another chemist, not these actual samples I am speaking of, but I know that samples have been sent to another chemist, and they always have borne out his analysis, which has been correct in every case.

2479. You put the standard at 3 per cent. for fatty solids, and 8·50 per cent. for non-fatty solids?—That is if an appeal to the cow is allowed.

2480. In your opinion is that a standard sufficient to prevent adulteration of separated milk to a large extent?—I think that milk of that composition is a fair, good commercial milk; it is a milk of good quality if it reaches that standard.

2481. You think that a standard lower than 3 per cent. would be insufficient to prevent adulteration up to the standard, whatever it may be, by separated milk?—I think milk ought to show 3 per cent. of fat; good genuine milk should have 3 per cent. of fat.

2482. The use of a standard of 2·5 per cent. would be insufficient, you think, with the cows with which you are acquainted, to protect the customer from the introduction of separated milk?—In most cases it would allow of the abstraction of cream or the addition of skim milk.

2483. Have you any evidence to give about a question which has frequently been raised, namely, whether there is any adulteration by the addition of water or otherwise, to milk in transit?—I have no actual evidence to give as to that; it is quite possible that milk is sometimes tampered with in transit, but I have no facts that I can give you.

2484. As a matter of fact, the churns are sent up by the main lines of railway not sealed, are they not?—The railway companies insist that they shall be sent unfastened. I may say that I have been trying to devise some means by which the churns might be fastened, and at the same

Mr. *Channing*—continued.

time to let the railway company ascertain the quantity of milk in them. I believe that the reason why they insist that they shall be unfastened is that they may verify the quantities sent. Their contention is that they are defrauded, that they have been carrying a great many more gallons of milk than the farmer has paid for; that is why they insist that they shall not be fastened. I have been endeavouring to see if I could not work out a churn fastened and at the same time showing the quantity of milk that it contains.

Mr. *Herbert Gardner.*

2485. About taking the samples either at the station at which the churns are sent, or at the station of arrival, have you anything to say about that?—For the farmer's protection I should say that a sample should be taken where he makes the delivery of the milk, at the station where he puts it on rail. It is out of his hands, and he has no control over it after it leaves his own cart; and his responsibility ought to end when he puts it on rail or delivers it at the station.

Mr. *Channing.*

2486. A question was asked you about the use of colouring matter in milk. Would you prohibit that in order to prevent adulteration?—I think it is desirable that it should be prohibited.

2487. Do you think it practicable to prohibit it?—I think it might be; I know it is done to a large extent. I think it might be prohibited.

Mr. *Herbert Gardner.*

2488. And for butter too; would you prohibit colouring matter in the case of butter?—I am scarcely prepared to go so far as that.

Mr. *Channing.*

2489. You object to colouring matter in margarine, but you do not object to it in butter?—No, because in the case of margarine it enables margarine to be sold for butter; in the case of butter it has no such effect, it does not add to the richness; it is entirely a matter of appearance.

Mr. *Herbert Gardner.*

2490. The inviting nature of the substance?—Yes.

Mr. *Channing.*

2491. As a matter of fact, colouring matter is introduced sometimes into thin poor milk to produce the appearance of rich milk, is it not?—Yes, I know it is done.

2492. With regard to this ration that you have given us, do you consider that, as a practical man, the best ration to produce the maximum of fat, or would you substitute another ration if you wanted to produce a higher percentage of fat?—My object is to produce a large yield of milk of the required quality.

2493. This ration then, I take it, from looking at it hastily, is not meant especially to produce an abnormal and more than usual quantity of fat

Mr. *Channing*—continued.

fat in milk, but is an average ration for well-managed cows?—I say it is more than the average ration; there are very few cows fed with such a ration; it is really higher than is generally given.

2494. I mean that chemically it is not specially directed to the production of fat as against other solids?—No. At the same time I may say I made some change in it with the view of raising the fat, and it had very little effect.

2495. What change was that?—I substituted 2½ lbs. of pea meal for maize extract meal.

2496. Have you used linseed cake at all?—Not very much; I do not find that it is suitable food for dairy cows.

2497. Now about margarine; all mixtures of margarine are by the Act compelled to be sold as margarine; but, as a matter of fact, is it the case that the margarine sent to the retailers is not invoiced as margarine?—I could not say what it is invoiced to retailers as; but in many cases it is not sold by the retailers as margarine.

2498. Your opinion is that it is impossible to deal with margarine frauds without travelling inspectors, I suppose; that is to say, inspectors who would go round and take samples freely?—And especially at the port of landing. All butter and margarine imported should be inspected and tested freely; all imported butter should be sampled and tested.

Mr. *Yerburgh.*

2499. I want to ask you one or two questions on the matter of margarine. In answer to Mr. Jeffreys, when he put the question to you as to whether you were opposed to any admixture of butter with margarine, I did not quite understand whether you were in favour of prohibiting any admixture?—My reply was as to the admixture of any margarine with butter.

2500. What I want to know is whether you think it would be advisable, in view of preventing the sale of margarine as butter, to prohibit the admixture of butter with margarine beyond the amount that is used for the necessary working?—I said beyond that minimum.

2501. Then upon the question of packages in which margarine is consigned; under the Act letters of a certain size are obliged to be placed on such packages?—Yes.

2502. A witness at our last meeting suggested that those letters should be increased in size; that would, of course, be with a view of attracting the attention of the public to the fact that margarine was being sold in those packages. I want to ask you whether you think that the end in view would be better secured if the margarine was consigned in vessels of a special character?—I think the cases in which margarine comes in are generrally of a different shape from those that butter is imported in.

2503. We were told by one witness that a manufacturer of margarine had offered to supply margarine, to send it over here (I think it was a foreign manufacturer) in vessels of any shape that his customer might like; what I want to get at is, whether you think it would assist us in

Mr. *Yerburgh*—continued.

preventing the sale of margarine as butter if margarine had to be sent over in special vessels?—I think that everything which made it more distinctive would tend to prevent its being substituted for butter.

2504. Do you think it would assist us further if such vessels had to be coloured with a certain colour; I do not know whether it is the law, but that suggestion was made by responsible authorities in Russia?—Every means which makes it more distinctive would undoubtedly help to carry out the end in view.

2505. Then if, in addition to vessels being of a special configuration and a special colour, if any packages in which margarine were sent, in addition to being lettered, or in place of it, were coloured red so as to attract the eye, would that be advisable?—It might be effective; I am not prepared to go so far as to say that it would be advisable.

2506. Do you think that anything that is effective is advisable?—To a certain extent. Of course adding colouring matter to margarine would be effective, but it is not advisable.

Mr. *Colston.*

2507. I do not know whether I got your figures right with regard to the difference of the quality of milk in summer and winter, but it would appear that the milk from your cows is a good deal richer in summer than in winter. Is that your usual experience?—I believe the last spring months milk is always poorest. During the autumn and the early winter months, I should say that the milk is quite as rich as in summer; and in autumn I am certain that it is. It is only in the late spring months when I believe milk always loses quality; it is almost impossible then to keep it up to the average standard.

2508. If you take milk in the depth of winter you would expect it to be as rich as or richer than in summer?—Yes, I think it would be.

Colonel *Bagot.*

2509. Did I correctly understand you to say that the price of margarine as it is now is rather above what it would be, supposing that it came in in its perfectly natural state?—I think that if all margarine were sold as margarine the price would then be reduced.

2510. The price of butter, do you mean?—The price of good butter would be increased.

2511. My point was that if the margarine had to be sold as such not only by law but with the practical knowledge of the buyer as margarine owing to its colour, then you think it would be cheaper than it is now?—I think it would be.

2512. Could you say what the present average price of margarine is?—I cannot say; I do not know what price it is. Of course there are various qualities and various prices.

2513. Therefore if your supposition with regard to the prices of butter and margarine is correct, supposing margarine to be sold uncoloured and clearly as margarine, although certain people who use butter would perhaps suffer by having to pay a little more for their

Colonel *Bagot*—continued.

butter, the poorer classes would rather gain by getting cheap margarine?—I think they would.

2514. Mr. Yerburgh asked you just now whether you did not think that if the cases that margarine came in from abroad (by that I suppose he meant the large cases) were coloured red it would be rather a good thing, and I think you answered that you were not quite prepared to recommend that?—I do not wish to advocate anything which makes it difficult for a man to carry on his business.

2515. That would add slightly to the expense of importing margarine, would it not?—To a small extent.

2516. There was another point which he joined with that question, which has nothing to do with the large cases in which it comes from abroad, but would simply be that the package in which it is sold in the grocers' shops should be coloured so that the public could recognise it more easily than simply by printing. That would not add to the expense of margarine, would it?—Not appreciably.

2517. Do you think that that would be a good thing?—I think that everything that would make it more distinctive must help the end in view.

2518. Do you think that the particular colouring of the packages as well as the lettering should be brought about?—I think if the purchaser saw that colour, he would more readily know what it was.

2519. It would not add to the expenses of the trader in margarine?—Not to any appreciable extent.

2520. There are, I believe, many special articles which are sold in specially coloured papers, are there not, in grocers' shops?—I suppose there are.

2521. You have no knowledge on that subject?—I could not give you any particular case at the present moment.

2522. Might I ask you on the subject of the analyses of your cows that you gave at different times of the year; you found that cows at grass give a better analysis as a general rule than cows fed in the best possible way in winter time?—In the late spring months; not in the autumn and early winter months. The milk is quite as rich then as it is when the cows are fed in the summer months on grass. It is during the few spring months that it is not so good.

2523. They are indoors in those months?—They are indoors from November to May.

2524. Therefore you could not say that on the average milk produces a better average where the cows are at grass than in the winter months?—No; it is quite as high in winter as in summer on the average.

2525. Was that your reason for saying that you did not think that a different standard should be adopted for summer and winter?—That is so. In the south of England the cows are several months more at grass than they are in the north.

2526. But I suppose that an average could be taken if you think there is any difference between the summer and winter months?—I do not think

Colonel *Bagot*—continued.

that there is between the average of the six summer months and the six winter months.

2527. As regards the figures which you gave us of the cows at grass and the cows indoors, do you consider the difference was owing to this being rather an extraordinarily good year for grass?—The pastures are of a better quality this year than they have been for many years.

2528. Do you account for the great difference in your figures this year by that?—There will always be a difference to a certain extent; but there is a greater difference this year than in most years.

2529. Can you tell us what you do with your skim milk; have you a regular market for it?—I do not sell it; I only sell whole milk.

2530. What do you do with your separated milk; you sell butter, do you not?—No, I only sell milk.

2531. What is done in your district with separated milk?—In my district the milk is all sold as milk.

2532. Is there no skim milk?—No; the farmers in my district always sell their milk as whole milk.

2533. But in a large district where butter is made, what is done with the skim milk?—As a rule it is kept at home and given to calves.

2534. Not sold?—Not in my district. I know it is done in factories.

2535. Near London do not the big farmers sell their skim milk?—Most of them sell it as whole milk. The factories, perhaps, sell that.

2536. But the fact is that you have no knowledge of that?—Some of it I know is sold as skim milk, and in other cases I know it is sold and used to reduce whole milk.

2537. There is a considerable demand for skim milk as such, is there not, not only in London but in country towns?—Yes.

2538. Is it not the fact that workhouse children are almost invariably given skim milk?—Not in those that I know. In all the unions in the north of England that I have any knowledge of they have whole milk; they do not buy skim milk. I do not know of any union in the north of England that buys skim milk.

2539. You do not know the Kendal Union then?—No, I do not.

2540. I want to ask you about condensed milk. Have you any knowledge of the business in condensed milk?—No personal knowledge. I have no evidence to give on that point.

2541. There is just one other question I want to ask you which has been asked several times, but I do not think that any very definite evidence has been given about it; that is, with regard to colouring milk. Have you any experience of the extent to which milk is coloured for the market?—I believe it is done largely in London more than anywhere else, because there is a demand in London for a higher coloured milk than is general in provincial towns.

2542. Is it not the fact that very nearly all the milk sold in London is coloured?—I believe it is, and milk of good quality. The people in London seem to require a higher coloured milk than they do anywhere else.

2543. And

Colonel *Bagot*—continued.

2543. And the colouring matter is not injurious?—No, it is not injurious.

Mr. *Frye.*

2544. What is it?—Anatto, I believe, is generally used.

2545. Is there anything else that is used at all?—Not to my knowledge.

Mr. *Colman.*

2546. In your own neighbourhood is milk coloured for sale?—No; people in the North of England like milk to be of the natural colour. In London if they only get the natural colour they think it is not genuine milk.

2547. Does that remark as to the North of England apply generally over the whole of the North of England?—I should say that it does, so far as I am aware.

2548. Then in colouring milk for the London market is that done by the farmers at the time they milk the cows?—I believe it is done by the dealer when it comes into his hands.

2549. Not by the farmer?—I think not. There may be cases where it is done by the farmer, but I think that as a rule it is done by the dealer.

2550. You told us I think that butter from Normandy is sometimes mixed with margarine?—I have every reason to believe it is.

2551. Have you any knowledge whether that has been done at all by English makers of butter?—Do you mean the Normandy butter mixed in England?

2552. No, what has been purchased as pure English butter. Do you know of any cases where it has been mixed with margarine?—I have heard of its being done.

2553. Recently?—Within the last two years.

2554. I understand you to make a reply something of this kind, that people go and ask for milk at a price at which they should know that they cannot get unskimmed milk?—Yes, I think that was in reply to a question whether institutions did not sometimes buy a lower or a mixed milk.

2555. Is it not within your knowledge that something of that sort occurs with reference to margarine or butter?—No; because I know that I have seen butter sold as genuine butter in summer in the market in the North of England at as low as 5*d.* a pound.

2556. And the people who buy that, although according to your theory they ought to know that it cannot be butter, go in and ask for it as butter?—But it is pure butter made by farmers and taken to market. I am speaking of butter in the summer months, when it is almost in a fluid state. That butter I have seen sold as low as 5*d.* You may be quite sure it is genuine butter, because margarine would not get into that state.

2557. You advocate the inspection of margarine factories; what is the special object of that inspection?—One is to see that nothing but pure fats are used, that nothing unwholesome is used; and another reason is that most of these

Mr. *Colman*—continued.

factories send out not only margarine but butter too.

2558. Is it your object to watch and see whether they mix the article before they send it out?—It would not be so necessary to have such thorough inspection of the factories if the sale of margarine as butter is put an end to.

2559. Do you think that there should be any inspection of large dairies where they are making butter?—I think it would be safer that they should be inspected where it is made in large quantities.

2560. That they should be put in the same category?—Yes, upon the same footing; because I know, as a matter of fact, that there are factories with the names of butter factories, and so on, where they send out large quantities of margarine as well.

Sir *Mark Stewart.*

2561. I want to ask you on just one or two points in regard to the feeding of your cows. Do you not prefer bean meal either to decorticated cotton cake or pea meal?—No. I prefer decorticated cotton cake for cows to any article of food.

2562. You do not find that it makes the milk too strong?—No. I have used much larger quantities of decorticated cotton cake than I give in this ration.

2563. You do not find that it is dangerous to the cows health?—Within certain limits. I would not give more than four or five lbs.; beyond that it might be dangerous.

2564. What is maize meal made of?—It is what is left after it comes from the cornflour manufacturers; a good deal of the starch is taken out, and you get more of the germ; the albuminoids are higher.

2565. You do not think that the feeding of which you told the Committee is too strong?—No, it is as high as I would recommend to go. I would not recommend going higher.

2566. There is a great difference, of course, in cows milk, whether they are young cows or old cows?—These are not old cows; they are cows from the third to the fifth calf, as a rule.

2567. Is it not the fact that the older cows give poorer milk, although in larger quantities?—I seldom keep a cow after the fifth calf.

2568. With reference to inspection; have you any views as to whether the Board of Agriculture or Somerset House ought to insist on more frequent inspections than at present take place?—I think it would be better perhaps if were taken out of the hands of the Local Government Board and put into the hands of the Board of Agriculture. I think it would be better carried out.

2569. Would that give farmers more confidence and satisfaction?—I think on the whole it would.

2570. You do not see any real practical difficulty in making a standard for milk?—Practically there is a standard now.

2571. But if you were to make a standard that you propose, 3 per cent. or 2·75 per cent., you do not think there would be any danger?—

Sir *Mark Stewart*—continued.

No; because the public analysts require it to be of that standard. Somerset House, perhaps, adopts a rather lower standard.

2572. Do you think it would be an advantage to have one known standard for the whole of the country?—I want to have it as high as possible, with a view of preventing the adulteration that now goes on so largely.

2573. If you make a low standard of 2·75 per cent., the public would not get the benefit of richer milk unless they paid for it?—I only advocate the 2·75 per cent. in case no protection is given to farmers to meet the cases of exceptional milk.

2574. But if it was 2·75 per cent. the public would get a greater proportion of milk naturally of a comparatively low standard, unless some special arrangement was made between the purchaser and the producer to have a higher standard, for which they would have to pay, in consequence, more money?—It would be very difficult to carry out, but it would be better if milk was sold by a scale of standard, but that would be almost unworkable.

2575. Is there much separated milk sold in London?—A great deal.

2576. As good milk? — Some is sold as separated milk, and a good deal is mixed with the other.

2577. What sort of test do you use?—I do not make a test myself.

2578. But have you any recommendation to make in testing milk, analysing milk?—No, I am not a specialist in that.

2579. Privately do you use the Babcock tester?—I have not great faith in that. I would not convict by the Babcock tester.

2580. I suppose there is no systematic mode now of getting samples of butter; that is to say, there is no systematic plan adopted from Somerset House?—I do not think so, for samples of butter.

2581. And analysing them?—I do not know that there is.

2582. Nor milk either?—All chemists do not adopt the same method of analysis. It is desirable that there should be a uniform system of analysis.

2583. But there is no uniform system at present?—No; and that always tends to variations between perhaps a local chemist and the chemist to the authority. The local chemist may adopt a different system from what is adopted at Somerset House.

2584. Then, on the whole, do you think that the present system works out fairly well, each chemist having his own standard?—No; I think it is desirable that there should be one uniform system of analysis, to secure greater accuracy.

2585. But you have no particular plan of your own in regard to a tester?—No.

Mr. *Whiteley.*

2586. You tell us that you are in favour of the prohibition of mixing butter and margarine altogether?—Yes.

2587. And that the direct result of that would be that butter would be dearer, whereas

Mr. *Whiteley*—continued.

margarine would be cheaper?—It would have a tendency to make butter of a higher price and margarine cheaper.

2588. I suppose you are aware that there is a large mass of our population that cannot afford to buy butter at the present prices?—Then, what I am advocating would enable them to get their margarine cheaper.

2589. Therefore you would enact by Act of Parliament that everybody who cannot afford to buy butter must eat margarine?—No, I do not; there are a great many grades of butter; genuine butter, varying from 8*d.* to 1*s.* 4*d.* per pound, to suit different incomes.

2590. But supposing that anybody cannot afford to pay 10*d.* or 1*s.* for butter, and cannot buy a a mixture under your thesis, they are bound to buy margarine?—They can buy butter at the present time, genuine butter too, as low as 8*d.*

2591. Generally speaking, I think they cannot buy butter as low as 8*d.*?—In a good many markets in the North of England you can at the present time.

2592. I am speaking generally, not locally. You would prohibit altogether the colouring of margarine?—Yes.

2593. But you would not prohibit the colouring of butter?—No.

2594. I suppose butter is coloured to suit the eye?—Yes, sometimes at this time of the year butter is not coloured; it is in winter and spring, when it gets paler, that it is coloured.

2595. When it is coloured it is coloured to suit the eye?—Yes.

2596. In taste it is the same?—Yes.

2597. Margarine is coloured likewise, I presume, to suit the eye?—And also to let it be sold for what it is not.

2598. Therefore you would not let margarine be sold except in as unpalatable and unsightly a form as it can be, that is to say, pure white?—I think the manufacturers of pure butter have the right to demand that it shall be so.

2599. Have you anything to say as to the sale of margarine in blocks of a certain size, in 1lb. and ½lb. blocks; are you in favour of that?—It would be better if it were sold in blocks of a uniform shape.

2600. Would not the fact of its being made in those blocks cause it to be deteriorated more readily by exposure to air?—I do not think so, because butter is generally made up in blocks of 1 lb. or ½lb.

2601. But butter will not keep as long as margarine?—Some butter will.

2602. Those people who were not able to purchase these butters and would have to go without, would you allow them to have half a block of margarine?—Yes, I would allow the blocks to be made in all sizes.

2603. You advocate that butter and margarine should not be sold at the same shop, at the same counter?—Yes.

2604. You would enact therefore by Act of Parliament that the fixings of a shop should be of a certain number?—I would not allow butter and margarine to be sold at the same counter.

2605. Then

Mr. *Whiteley*—continued.

2605. Then they must have two counters at every shop at which margarine is sold?—If they want to have margarine and butter sold in the same shop.

2606. All this, I suppose, as you have said once or twice, is in the interests of trade?—In the interests of the farmers in England, and to a certain extent in the interests of the consumer.

2607. Are you aware that four-fifths of the butter consumed in England comes from abroad?—I could not give a precise figure, but I suppose that the proportion imported varies practically from month to month.

2608. All these measures which you advocate, which would handicap the consumer and bonus the producer, would bonus four foreign producers of butter for one English producer?—What I am advocating would not handicap the consumer, because if the producer at home had the protection I am advocating he would be able to make larger quantities. It is the fact that he has to meet this competition and the low prices that it entails, which prevents him making butter at all.

2609. If, as I have pointed out, there are four producers of butter in foreign parts for every one in England, foreign producers would be benefited four times as much as English producers?—It does not matter if we benefit our own producers at home.

2610. Therefore, your evidence is that so long as you benefit your own home production, the consumer is not to be taken into consideration, nor is the fact that four-fifths of that extra amount paid will go into the foreign producers' pocket?—I say that what benefits the producer at home would to a certain extent benefit the consumer.

2611. Are you aware that a large amount of milk is used in the production of this margarine?—A certain amount of milk is used.

2612. And that margarine is produced to the greatest extent on the Continent?—The bulk of it is, undoubtedly, produced on the Continent.

2613. Is there any importation of milk from the Continent?—There was a little. I do not know whether there is any actually at the present time.

2614. Supposing the milk was not used in the manufacture of margarine on the Continent, would there not be probability that we should have to suffer larger importations of milk in this country?—I do not think so. I do not anticipate that there will be ever any great influx of milk from the Continent; I do not think it would be allowed.

2615. Is it not the fact that the fat of cattle has increased in price owing to the manufacture of butter substitutes?—My idea is that the price of cattle fat has gone down very much. It is lower than it ever was before.

2616. Why do you say that?—The butcher I sell my cattle to says that one reason why he cannot give me a better price is the low price that he makes for the fat that he sells; and from time to time he has quoted me figures comparing the price which he now receives with the price

Mr. *Whiteley*—continued.

which he received a few years ago. I believe it has gone down more than 50 per cent.

2617. Then the increased demand upon the fat of cattle has had the result of pulling the price of fat down?—I do not say that that is the cause.

2618. That is generally contrary to the way affairs go; I suppose tallow is sold for about 23*s.* a hundredweight?—Something like that; I believe it is 1*s.* 9*d.* a stone.

2619. The oil of margarines is worth about 40*s.* a cwt., and stearine is worth about 30*s.* a cwt.; the two component parts of the tallow have each of them increased in value by about 50 to 75 per cent.?—Anyhow the price of tallow is lower than ever it was before.

2620. You say you would appoint inspectors to carry out the Acts in a rigid manner?—I want the Acts carried out in a manner more thorough than they are at present.

2621. In your opinion are the powers in the hands of the local authorities sufficient if they were carried out at the present time?—Not altogether; to a great extent they are, if the Act were thoroughly administered.

2622. To a certain extent the powers that already exist are sufficient to prevent mixing or adulteration if they were carried out?—I am not aware that an inspector at the present time has authority to test samples of butter and margarine that are imported; butter especially. I think it is only when it comes into the hands of the retailer.

2623. But when they do come into the hands of the retailer he has that power?—Yes, I recommend that they should go to the fountain-head and test it there.

2624. When it is imported?—Yes, as soon as it is landed I should have it inspected.

2625. I suppose the analysis of those samples would take some time?—Not very long, as I am advised.

2626. What is to happen to the consignment while the analysis is being made; is it to be permitted to go bad?—I gathered from you just now that margarine kept longer than butter, and there would not be much risk during the time necessary to have the test made.

2627. Supposing it happened to be butter; but, at any rate, the analysis is not a very speedy process, is it?—It might take 36 hours. I am not prepared to say.

2628. Meanwhile the cargo, or consignment, is to lie by until the analysis is made?—Butter that will bear shipment is prepared to keep, and will keep, longer than butter made for immediate sale, and it would not suffer to any extent by the period necessary for analysis.

Mr. *Frye.*

2629. Do you mean to say that fresh butter would not deteriorate by keeping it 36 hours longer than usual?—Most of it is not fresh butter.

2630. I am speaking of fresh butter, like Normandy butter?—I think it would bear the 36 hours. Well-made butter should at least keep for seven days perfectly sweet and fresh.

 2631. With

Mr. *Whiteley.*

2631. With regard to the inspection of margarine factories I am in agreement with you; but are you aware that most of the margarine factories are on the Continent?—A great number of them; but there are a certain number in Great Britain; I think 17.

2632. Nine or ten was the number given us; but you would place our own margarine factories under more rigid conditions than you could the continental ones?—We cannot impose our regulations on the Continent, of course.

2633. That would tend to keep away from this country the manufacture of margarine, would it not?—I would not impose any conditions under which a legitimate business could not be carried on.

Mr. *Yerburgh.*

2634. Mr. Whiteley asked you, I think, as to whether you knew that four-fifths of the butter consumed in this country comes from abroad; on that I should like to ask you whether there are any figures as to the amount of butter produced in this country?—It is only an estimate of what is produced in this country. You have the figures of the quantity imported, but it is only an estimate of what is actually produced here.

Mr. *Whiteley.*

2635. Can you give us your estimate?—I have never formed one.

Mr. *Yerburgh.*

2636. If we have not got any figure as to the amount of butter produced here, have we any estimate of the amount of butter consumed here?—It can only be an estimate and not a very close one. You must take the number of cows and how much of the milk is sold as milk, and how much is turned into cheese, and then assume that each of those cows should make a certain number of pounds of butter.

2637. Therefore you can have no absolute figure?—No reliable figure.

2638. Then we should not be justified in assuming, as we have not got this figure, that four-fifths of the butter consumed here comes from abroad?—I should scarcely take it as correct that that quantity did. I have no means of saying that it is not so.

Mr. *Frye.*

2639. You said this morning that you would not allow any colouring to be put into margarine; would you prohibit the colouring of butter?—No. I have already said that I am not prepared to prohibit that.

2640. But would it not be very unfair to allow one article to be coloured and the other not?—I do not think so; one article is coloured so that it may be sold for what it is not. Butter is only coloured to make it more attractive, and still to be sold as butter.

2641. What would be the colour of pure butter if it were not allowed to be coloured?—I should say that three-fourths of the butter that is sold is absolutely uncoloured; it is only a small proportion that is coloured at all, and that generally during only a few months of the year.

Mr. *Frye*—continued.

2642. If they were both prohibited from being coloured, the colour would be very little different, would it not?—Margarine is of a much paler colour than butter. It is possible that during a month or two butter from the milk of very badly fed cows might be only a little higher in colour than margarine; but there is very little butter indeed that approaches margarine in colour.

2643. Foreign butters that come into this country, I suppose, are coloured, are they not?—Yes.

2644. Would you prohibit those being coloured?—I do not think that much of the imported butter is coloured really.

2645. But if they were, would you prevent the makers from using colouring matter?—No, I do not think I should interfere with the colouring of butter at all.

2646. I suppose you are aware that vast quantities of margarine are used in large institutions, such as workhouses?—Yes.

2647. And lunatic asylums?—Yes. In many cases it is sold, not as margarine, but as Cork thirds. I know unions and workhouses where that is done.

2648. I suppose that good margarine is better than bad butter, is it not, at the same price?—Good butter is more wholesome.

2649. You said just now that you would insist upon margarine being labelled in hotels and restaurants; what sort of a label would you have placed on it?—I go into a restaurant, and ask for butter; I do not ask for margarine, and I do not require it to be labelled. I want to be sure I get butter when I ask for it.

2650. How do you know the difference; could you tell the difference?—I want to be protected from having margarine when I pay for butter.

2651. Then you must have a label?—No, I do not ask for margarine; I ask for butter. I do not ask that butter shall be labelled.

2652. I do not see how you will obtain what you want?—The course that I have been recommending, I think, would prevent my being supplied with margarine when I go to a restaurant and ask for butter.

2653. Would you prevent the hotel keepers from buying margarine at all?—I would not allow them to sell it as butter or supply it to customers as butter. They may have customers who might ask for margarine. In that case I would allow them to supply it.

2654. You said that you would have all margarine factories licensed; I suppose that you know that they have to be registered now?—I do not know whether I went so far as to say that they should be licensed. I think I said that they should be registered. I am not prepared to say that a license might not be imposed too.

2655. Do you know that they have to be registered now?—Yes, I believe they are. I think they should be. I believe there are some factories at which margarine is made that are not registered.

2656. You were asked just now about the painting of the barrels in which margarine is imported into this country; I understand that you

Mr. *Frye*—continued.

you are not in favour of that?—I scarcely went so far as that.

2657. And as regards the inspectors I fancy from what you said that the number of these inspectors would be greatly increased?—I think it is necessary that there should be more of them.

2658. Where is the money to come from to pay those inspectors?—If a license was imposed that would go towards meeting the expense.

2659. I should like to know what sort of sum for a license you would suggest that those who sell margarine should have to pay?—I am scarcely prepared to suggest that they should pay for a license.

2660. You would prevent persons in shops selling margarine from the same counter as butter?—Yes.

2661. Are you aware that the greater part of this trade is done by small traders, to whom it would be quite impossible to have a second counter?—It is done by all classes of traders. It is not only the small traders who do it; many of the large traders do it as well.

2662. I am speaking of the small shopkeepers?—He would have to have some division made in his counter; some partition made.

2663. But they have to have labels now on this margarine, have they not?—Hitherto the labelling has not prevented the substitution of margarine for butter in many cases from these shops.

2664. Then they run the risk of being fined, of course?—The profits on the transaction are much greater than the risk. They can afford to do it.

2665. Then you said something about condensed milk; you said condensed milk was mixed with ordinary milk?—With skim milk; and I am led to believe that it is.

2666. I suppose condensed milk has to be prepared with sugar?—Yes; I think that is part of the process.

2667. Is it possible to mix that with separated milk, and for it not to be detected immediately?—I do not think it would be detected except by analysis.

2668. You said something about your being able to buy pure butter at 1*s.* a lb., did you not?—Yes, at the present time, and much less than that in some markets in the North of England. I do not say that you can get the best butter at 1*s.* a lb., but you can get genuine butter at 1*s.* a lb.

2669. Would it be Irish butter or English?—English butter; locally made butter.

2670. And if all these prohibitions were put upon margarine, you would put up the price of that butter?—It would tend to raise the price.

2671. That is, I suppose, what you would wish to do?—That is one reason. I should like to see the genuine article at a better price.

Mr. *Yerburgh.*

2671*. Upon the question of the use of margarine by institutions, and also upon several questions asked by Mr. Whiteley with regard

Mr. *Yerburgh*—continued.

to the use of margarine in the North Country, I do not understand that you propose to prohibit the authorities of such institutions, or private buyers, from buying margarine, and from buying butter, and from taking those purchases home and mixing them at home if they wish to do so?—Certainly not; I would allow the purchaser to do what he liked with them, It is only the people who sell it that I would not allow to mix it.

2672. Therefore you would see no objection to such purchases being made by authorities of institutions and private persons?—I would not interfere with persons buying what they like.

2673. Therefore they could make purchases of what they wish at proper prices, and the result would be the same as if the mixture were made in the shop?—They might not make quite such artistic blends.

Mr. *Frye.*

2674. I understand that you advocate the selling of margarine alone, and butter alone?—Certainly. I do not wish to interfere with the sale of margarine as margarine.

2675. And you would allow a customer to mix it at home?—Yes.

2676. How could he do that?—He must do it according to taste.

Mr. *Whiteley.*

2677. Is not the mixing of margarine and butter a matter of mechanical skill as it is done on the continent?—No, except as it is done in the highest degree.

Mr. *Yerburgh.*

2678. Are you aware of the practice in Copenhagen in this respect?—No.

2679. We were told by a witness the other day that it was the common practice there for retailers to sell butter and margarine, and that the bulk of the customers who bought the cheaper sort of butter preferred to buy 2 lbs. of margarine and 1 lb. of butter, and, in that case, the retailers always presented them with a small capsule of colouring matter with which they might make the mixture at home; you were not aware of that practice?—I was not aware of the practice.

2680. I suppose if they can do that in Copenhagen they can do it in this country?—I would not seek to prevent them.

Sir *Mark Stewart.*

2681. As a practical matter, I suppose if margarine were bought by itself, it would be used more for cooking purposes, but butter would be used more on the table?—By some purchasers margarine would be used for cooking purposes, but by others for table purposes.

Mr. *Whiteley.*

2682. Are you aware that the London County Council and the Asylums Board send out tenders both for margarine and for mixture?—I thought we were told that it was not allowed to sell mixtures except as margarine.

Mr. RICHARD BANNISTER, further Examined.

Mr. *Whiteley.*

2683. HAVE you heard of prosecutions for dyed sugar as an adulterated article?—Yes.

2684. Can you give the Committee any particulars with regard to the colouring of sugar?—The colouring of ordinary raw sugar as imported, do you mean?

2685. Yes?—The ordinary raw sugar that is imported varies in colour according to the amount of caramel that is left in the sugar itself. When we come to crystals of Demerara sugar, they are made by the vacuum-pan process, and in certain descriptions there is a chemical used for the purpose of giving the crystals their distinctive bloom.

2686. If coloured or yellow crystals are sold as Demerara sugar, ought the sellers, in your opinion, to be prosecuted under the Sale of Food and Drugs Act for adulteration, or under the Merchandise Marks Act for giving a false trade description?—It strikes me that it should be under the Merchandise Marks Act, so long as the colouring matter is so small that it does not amount to an adulteration.

2687. You do not consider that the colouring process is an adulteration, except beyond a certain point?—I have examined a sample that has been coloured, and the amount of adulteration by colouring is so small that it could not be considered an adulteration.

2688. Where do you think adulteration begins?—It is very difficult to say where one begins and the other ends; it depends entirely upon the article itself, and the purpose for which the colouring matter is employed.

2689. In your work, as judge of food at the Chicago and Paris Exhibitions, were any samples of dyed sugar brought under your notice?—No, except some of the Demarara sugar coloured for the American market; but not dyed in that particular way. It seems that in America, at the present time, refined sugar, or what is equivalent to refined sugar, only pays a duty on importation; the lower qualities of sugar pay no duty. Some of the sugars that are sent from the West Indies into America are coloured with caramel for the purpose of bringing them in without duty. If they came in at the ordinary colour they would pay duty. At the Chicago Exhibition I saw a number of these crystallised sugars that really had been coloured with caramel for the purpose of evading the duty.

2690. Is the colouring removable afterwards?—Yes, by subsequent refining.

2691. Are you familiar with whisky analysis?—Yes.

2692. Is it difficult in analysing whisky to discover what per-centage under proof the sample is?—We scarcely call that a chemical operation; it is a mechanical one; a very simple operation indeed.

2693. Would a quarter ounce sample be sufficient to enable you to make a correct analysis?—You would have to use a very small vessel for doing your work then, but it might be done. I should not like to work on such a small quantity myself.

Mr. *Whiteley*—continued.

2694. Do you call it careless for an analyst to make a mistake in analysing a quarter of an ounce sample?—Yes, I should when estimating the strength only.

2695. Have you ever heard of such mistakes being made?—We have had a number of such cases of spirits at different times, in which the strength of the spirits has been wrong, where the analyst who had examined the sample of spirits had pronounced them to come below the limit, and we have found that they were above the limit.

2696. Have you ever heard of any prosecutions with regard to the sale of beeswax under the Sale of Food and Drugs Act?—Yes, I have.

2697. Can you give us any details as to that?—I cannot give you the details because not one sample of beeswax has been referred to us.

2698. In your judgment does beeswax come under the term of "food" or "drug"?—In the Pharmacopœia we do not find the expression beeswax at all; it is called yellow wax.

2699. Is certainly is not a food; you told the Committee, at Question 549, that you had five samples of ginger?—Yes.

2700. Have you ever found that spent ginger has been used as an adulterant to any extent?—I have had samples that I have examined that did contain spent ginger.

2701. Is there any proper commercial use for the product that is known as spent ginger?—No, unless a certain quantity of extractive matter is left in the ginger.

2702. Would the sale to the public of genuine ginger with which spent ginger had been mixed, be a fraud on the purchaser?—It would depend upon the price, because the price of ginger varies greatly.

2703. The cheaper gingers in all probability contain spent ginger?—They might, and some of them do.

2704. And with regard to cocoas, are any cocoas sold in this country. This is a question which has just been put into my hands. In a prosecution which has just taken place in France with regard to cocoa it was contended that by the extraction of a portion of the fat the cocoa was falsified, and that by the augmentation of the natural alkali the cocoa was rendered injurious; on the other hand, the exact contrary was maintained; and the court decided in favour of the cocoa manufacturers. Has there been any prosecution for any case of that sort in this country?—There has not.

2705. In any of the cocoas sold in this country is the natural proportion of the constituents altered by the extraction of fat and the augmentation of the alkali salts. If so, is this advantageous or otherwise?—The cocoa you refer to is one that is generally called by the name of essence of cocoa, or Van Houten's, or such cocoas as that, where you have a large quantity of fat taken

Mr. *Whiteley*—continued.

taken out of it, and then treated so that it can be worked down to a powder without the addition of sugar or any other starchy matter. In my lecture on cocoa this is referred to, and if I may be allowed to quote from it it will perhaps cover the ground better than any answer that I can give: "Of the different descriptions of commercial cocoa now before the public it is only just to the manufacturers to say that no kind has during the last few years so advanced in public estimation as this which has been deprived of the greater part of its natural fat and made more soluble by special processes. It is not my duty to direct attention to the production of any special manufacturer, but it is right that I should point out that cocoa so prepared is a very valuable article of diet, and is the best of the many preparations of cocoa submitted to the public. As the nitrogen is increased by the removal of the greater portion of the natural fat it has become richer as a flesh-former than when in its natural state, and being made more soluble, the inconveniences inseparable from ordinary cocoa preparations have been greatly modified. Cocoa does not suit every constitution, but to those who can take it, and prefer it to tea or coffee, there is no doubt that the modern preparation now under consideration is of very great value. It has none of the objections of the so-called soluble cocoas, and yet is very soluble and nutritious, being strongly recommended by the medical profession in cases of debility as a partial substitute for tea and coffee. Those manufacturers who use an alkali to increase the solubility of the cocoa are careful to use such as are wholesome. By this means the solubility is increased considerably, and such a cocoa appears to please the public. The average ash of raw cocoa is from 2·5 to 3·2 per cent.; that of fat-reduced cocoa is from 4 to 5 per cent.; and cocoa treated with alkali gives an ash as high as 8 per cent. The principal constituents of the ash to which alkali has been added are potash and phosphoric acid, two important and valuable mineral substances required for building up the bones and tissues of the body."

Sir *Mark Stewart.*

2706. Is that Van Houten's cocoa to which you are referring there?—It is all that particular class of cocoa from which fat has been taken.

Mr. *Whiteley.*

2707. You said in one of your answers that the margarine fat was very similar to the fat that exists in milk, did you not?—I shall have to refer to my note for a moment for an explanation of that. There are some acids common to both, and there are other acids that are present in the milk which are not present in the bullocks' fat, of course.

2708. It is Question 667, "Is it then fat of the same nature which exists in milk?—(*A.*) Yes."?—That is quite right. When we come to the fat of milk which is concentrated in butter we find that the acids that are present in the butter are butyric, caproic, caprylic, and capric, and those are soluble in hot water. Then those that are insoluble are the myristic, palmitic, stearic, and the oleic; those are chiefly present in beef fat, and the four first are almost entirely absent from beef fat.

Mr. *Whiteley*—continued.

2709. I should like to ask you your opinion of margarine as an article of food. Is it as nutritious as butter?—I should say that it was.

2710. In every respect?—Yes; but, of course, it is not so palatable.

2711. With regard to beer, you have had a great number of samples of beer sent to you, over 17,000, for analysis, and you found, I believe, over 3,000 in some measure adulterated. What was the chief adulterant used?—Water or sugar, or a mixture of sugar and water.

2712. A former witness (Mr. Thomas, I think informed us that in his experience beer was only adulterated by salt. That is not your experience? We do not find that to be the case.

2713. Is not some of the sugar that finds its way into beer used in priming the beer?—It is.

2714. And as such it is not used as an adulterant, but to give the beer a better appearance?—It is for the purpose of making the beer quite fresh during the time it is on tap.

2715. Generally speaking, the popular idea that beer is adulterated with all sorts of noxious chemicals is a false one?—It is a false one.

2716. As a matter of fact, beer is almost entirely a pure article, with the exception of some amount of sugar, is it not?—I state emphatically that during the last 20 years we have not had one case of noxious adulteration of beer.

Mr. *Kilbride.*

2717. I think you stated last week in reply to Mr. Hearley that there is a great difference in the quality of the milk obtained from the same cow, between what he called the fore milk, that is, the milk taken in the first part of the milking from the cow, and the last portion of the milking; I think you said that you analysed it, and found that it differed very much from the milk at the end of the milking?—The fore milk contained a very fair quantity of fat, and that taken at the end of the milking contains an excessive quantity of fat.

2718. What difference would there be?—That depends upon how far you divide the two portions of the milking. From experiments made, if you divide the milk of a cow into three portions, you find that in the last portion you get rather more than three times as much fat as you do in the first portion.

2719. If milk taken altogether from the first portion of the milking from a number of cows was submitted to you, would you say that that milk was adulterated; or would you say that it was good milk?—We should report that it was deficient in fat: the solids not fat would be all right; but we should say that it was deficient in fat.

2720. Still it would be pure milk, would it not?—Yes, so far as drawing it from the cow is concerned, there is no doubt that it would be pure milk.

2721. But there would be this enormous difference which does exist between the first milking from the udder and the last?—Yes.

2722. Would you say that your milk supplied altogether from the first portion of the milking

Mr. *Kilbride*—continued.

to a contractor was pure milk; would you say that the man ought to be prosecuted, or, if prosecuted, that he ought to be fined for so doing?—I think that he should be prosecuted, because I think it is a fraudulent transaction for a man to divide his milk, simply because he has got a contract at a very low price.

2723. I think you stated, or at least it was stated by one witness here, that there is an enormous difference in the percentage of water contained in the butters of different countries?—Yes, I did.

2724. I think you said that New Zealand butter contained as low as 8 per cent. of water?—8·8 per cent.

2725. I suppose there is no butter without some water in it?—It could not be made without water.

2726. What is the range of variation in the percentage of water in butter?—As a rule a large quantity of the fresh butter which is imported from Normandy contains from 12 to 14 per cent. of water, as I have already stated, and the tub butter, that is to say, the salt butter imported from Denmark, will go up as high as 16 per cent., while some of the butter that is imported from Ireland will contain as much as 24 or 25 per cent. in special cases.

2727. What standard do you fix for the maximum percentage of water that pure butter ought to contain?—You have to draw the line again between salt butter and fresh. Fresh butter would not contain as much water as salt butter; and as regards salt butter, I think when you get to about 16 per cent. that ought to be about the margin for salt butter.

2728. Why do you fix that percentage as the standard?—I do not fix that as the standard; that is an opinion of mine. I think that if a person makes butter in the proper way, it ought not to contain more than that percentage of water; and if it contains more than that percentage of water, I think it will be found, as a rule, that when it goes on to the market the butter will not command the same price as one which contains less water.

2729. Then there is no standard, as a matter of fact, to be fixed by Somerset House for water in butter?—There is no standard.

2730. Is there any standard fixed by the Society of Public Analysts as to the percentage of water in butter?—I believe there is not.

2731. Are you aware that Somerset House has passed butter as pure which contained 19 per cent. of water?—No, I do not think we have done so.

2732. Are you aware that Dr. Bell stated that pure butter will sometimes contain over 20 per cent. of water?—I think, I can explain where we are differing. Those samples which you find in Dr. Bell's book were samples that we had obtained in order to see the quantity of water in commercial butter at that particular time, and there is no doubt that the sample of butter there mentioned was a pure butter so far as its manufacture was concerned, and that it did contain that quantity of water; but it was not a reference sample.

2733. But it was a pure butter?—Yes.

Mr. *Kilbride*—continued.

2734. Are you aware that Professor Carroll of Dublin says that pure butter may contain from 5 to 30 per cent. of water?—It may contain it.

2735. Pure butter?—Yes, pure butter and water.

2736. But according to you, you know, all butters are butter and water?—Exactly.

2737. But what I want to know is whether you are aware that Professor Carroll says that pure butter may contain from 5 to 30 per cent. of water?—It has been very unskilfully made then.

2738. Do you think now that it is reasonable to expect small dairy farmers with only three or four cows to be able to turn out as high class butter as the butter made in large co-operative dairies?—I am quite sure that they cannot do it so well. Their difficulties arise from two causes. In the first place they want to make their butter up into tubs of a certain weight, and they have such a small quantity of butter to put into the tubs at one time, and they are so long in filling a tub that you would find that the butter is bad in itself, badly made, and frequently contains a large quantity of water on account of the brine that is used.

2739. That would not be adulterated butter?—No, it would not be adulterated butter, but as a commercial article there would not be a demand for it, of course.

2740. Are you aware that out of 2,090 samples of butter tested at the Government Laboratory at Copenhagen 15 per cent. contained from 16 to 20 per cent. of water?—I should like to see that return, because I saw one which I obtained where there were some thousand samples examined, and the highest of them contained 17 per cent. of water.

2741. This is the return (*handing in the same to the Witness*). I think you will find that 15 per cent. of those samples contained from 16 to 20 per cent. of water?—Yes, 15·7 per cent. of the samples contained from 16·0 per cent. to 20 per cent.

2742. Are you aware that the Danish Government spend large sums of money annually on the special cultivation and encouragement of their butter industry?—Yes, they do.

2743. Do you know what this Government has done for Ireland in that direction?—I do not know that it has done anything.

2744. As a matter of fact it has done nothing. Have you any practical knowledge of butter-making?—Yes, I have.

2745. Where did you acquire it, may I ask?—At home.

2746. How often have you seen butter made, and did you analyse the same to ascertain the percentage of moisture that it contained?—No, I did not, because as a lad I saw the butter constantly made, but I did not become a chemist until afterwards, so that I could not put the two parts together.

2747. At what time of the year did you see it made, I suppose at all times of the year?—Yes, at all seasons of the year.

2748. Is it easier to work butter in summer than in winter?—No; if it is very hot it is difficult to work butter, and of course if it is very cold,

it

Mr. *Kilbride*—continued.

it is also difficult to work it. You want an equable temperature for the purpose of working butter.

2749. Is the bulk of the Irish butter which comes over here made to keep from three to six months?—It is, and even a longer time.

2750. Is the ordinary English butter that is generally made in this country, and also the butter that comes from Brittany and the Danish fresh butter, intended to be kept for that time? —Not the Danish fresh butter, nor the butter from Brittany; you get two kinds, salt and fresh. The butter made in this country is generally fresh butter, and is not made for keeping at all; but the butter that comes chiefly from Denmark is salt butter.

2751. Are not these butters made with dry salt?—Yes, as a rule they are.

2752. They do not require pickle like the Irish butter, which is made to keep from three to six months?—The Irish manufacturer does use a pickle; but it is not necessary, even if he uses a pickle, to get that large quantity of water into his butter.

2753. If butter is to be kept sweet and good for from three to six months, is it not necessary to use from 4 to 5 per cent. of salt in the form of pickle?—At any rate, if it is necessary to use that amount of salt, it is not necessary that that large quantity of water should remain in the butter.

2754. To prevent from 4 to 5 per cent. of salt crystallising, is it not necessary to use from 12 to 15 per cent. of water?—I daresay that it would be necessary to use that quantity of water.

2755. That was the evidence given by Sir Charles Cameron at the Manchester butter trials. Will not that quantity of water, therefore, increase the moisture afterwards found on analysis in the butter?—No, it ought to be worked into the butter at the particular time; and therefore, as soon as the butter is put into the tub, the quantity of water that you ought to find afterwards in the tub ought to be the same as then, or very close to it.

2756. Would you allow any percentage of difference, and if you would, what percentage of difference would you allow?—You are compelled to make a difference, because, as soon as you begin to cut the butter, a quantity of water will separate, and it depends upon what part of the tub you are cutting into as to the percentage you get. I think it very likely that the difference in the percentage found by the analysts at Manchester can be traced to that particular cause, because the quantity of water in the tub will vary.

2757. Would you allow of any increased percentage of water in butter which is made to keep from three to six months more than would be contained in butter that is made to keep only a week?—There need not be more water, but there must be more salt, because water is not a preservative; it is the salt that is the preservative.

2758. Would you allow of any difference in the percentage of water at all?—Yes. I say that if you get a tub of butter containing 15 or 16 per cent. of water, that is as close as a man can well work it.

2759. I want to get the exact percentage of difference that you would allow between butter

Mr. *Kilbride*—continued.

made to keep from three to six months, and butter made to keep for a week?—In butter that is made to keep for a week you need not have above 10 per cent.; but you generally get 12 to 14 per cent.

2760. I again ask you what percentage of difference would you allow, or would you allow any?—I think the point is this, that you are thinking or speaking as if the water is a preservative. I say that the salt is the preservative, not the water.

2761. If the salt be preservative and not the water, then according to you there ought to be no difference in the percentage of water between salt butter and fresh?—There would be a difference, because the salt itself being mixed with the butter will take up water.

2762. You have acknowledged that to keep from 4 to 5 per cent. of salt from crystallising it would be necessary to use from 12 to 15 per cent. of water?—Even if you use from 12 to 15 per cent. of water, the final quantity of water need not be above 16 or 17 per cent.

2763. Then, according to you, there ought to be a difference of 3 or 4 per cent. of water in a tub of fresh butter and a tub of salt butter?—I think that is quite sufficient to cover the whole difference in the manufacture.

2764. Would you go higher than 4 per cent.? —That is high enough.

2765. You said that 16 per cent. of water was the maximum amount of water that English butter contains?—No, I do not say that.

2766. You say that 16 per cent. of water is as high a percentage as it ought to contain?—Yes.

2767. Have you ascertained that by analysis? —Yes.

2768. How many samples have you analysed? —I cannot tell you how many samples, but this is a matter of constant examination.

2769. From your experience have you found that butter made in hot weather contains more water than butter made in cold weather?—Yes, as a rule it does.

2770. Why is that?—Simply because you cannot work the butter in hot weather as well as you can in the colder weather; it is more in the form of a thick cream than in the form of a solid butter.

2771. Therefore it is your opinion that the temperature at the time when the butter is made has a great deal to do with the percentage of water that will be found in the butter subsequently?—That is my opinion.

2772. In fact it is your opinion that the water cannot be pressed out of it in very warm weather?—I expect that the large manufacturers have got some mechanical means of doing it, but I am not acquainted with it, except that they can get cold water.

2773. What percentage of water is there in milk?—It varies; but if you take the total solids as 11·5 per cent., that will give you 88·5 per cent. for the water.

2774. There would be from 87 to 88 per cent. of water?—Yes.

2775. And perhaps more?—Yes.

2776. What variation of water is there in milk?—Four or 5 per cent., or even more.

Mr. *Kilbride*—continued.

2777. What is the percentage of water in cream?—That would depend upon whether it is a cream that is obtained by a separator or not. Cream that is obtained by a separator may contain 50 per cent. of water.

2778. Would you be surprised to learn that there is such a variation as from 33 to 67 per cent.?—I should not be at all surprised to learn it, simply because when we talk about cream we have either thin cream or thick. We have some cream only slightly thicker than milk, and we have some cream so thick that we have to cut it with a knife.

2779. You have stated, I think, that temperature has a good deal to do with the making of butter?—Yes.

2780. Do you know at what temperature butter should be made, and at what temperature milk should be kept for the purpose of making butter?—It is not the milk; it is the cream in the churn.

2781. What ought the temperature to be?—If you could get it down to from 58° to 65° degrees it would be very convenient for working.

2782. Is there a wide variation in the quality of butter, and in its market value?—There is; and that market value has no relation to its chemical composition.

2783. Is it the fact that the percentage of water varies in all butters to the extent of from 5 to 16 per cent.?—Yes, from 5 to 16 per cent.

2784. I suppose you will acknowledge that in some English fresh butter there is as much as 20 per cent. if water?—I have found it.

2785. Would any man buying butter containing, say, 15 per cent. of water be prejudiced in his purchase over a man buying butter containing only 5 per cent. of water?—Yes, if it were the same quality of butter.

2786. How are you to protect the purchaser from being prejudiced within these limits?—I do not see how we can protect him.

2787. If you say that a pure butter ought to contain only 16 per cent. of water, and there is butter made with only 5 per cent. of water, the man who buys the butter with 16 per cent. of water in it is surely very much prejudiced as against the man buying butter with only 5 per cent. of water?—Yes, as compared with the man who buys the other butter at the same price.

2788. What difference would you allow between the best butter made in Denmark on scientific principles with the best appliances, and the cheap commercial butter that comes over from Ireland?—Do you mean the difference in the commercial value or the difference in the percentage of water?

2789. I mean the difference in the percentage of water?—There should be very little difference in the percentage of water.

2790. Then you would allow some difference between the Danish butter made with these appliances that you referred to just now for pressing the water out of it, although the Irish butter made by hand would not be fraudulently adulterated even when it contained 20 per cent. of water. What

Mr. *Kilbride*—continued.

kind of percentage of water would you allow in the two processes?—I think that something ought to be done in a case of that kind as in the case of poor milk. If a sample containing that quantity of water were to be examined, and it could be traced up to the manufacturer of it, if his appliances were so bad that he could not use a less quantity of water, he ought not to be punished.

2791. What quantity of water and fat does cheese contain?—It varies greatly.

2792. Take American red cheese?—In an analysis of commercial cheese we find that the American red cheese contains 28·63 per cent. of water.

2793. And what percentage of fat?—38·24 per cent.

2794. And Cheshire cheese?—Cheshire cheese contained 37·11 per cent. of water and 30·68 per cent. of fat.

2795. And Dutch cheese?—Dutch cheese contained 41·30 per cent. of water, and 22·78 per cent. of fat.

2796. Then American red cheese contains 13 per cent. less water than Cheshire cheese?—Yes; but the American cheese and the Cheshire cheese are not made in the same way. The American cheese is made by pressing, and the Cheshire cheese is made partly by heating and partly by pressure; so that you find that one is what we call a tough cheese, and the other is a curdy, brittle cheese.

2797. As a matter of fact, Cheshire cheese contains more water and less fat than American cheese?—It does.

2798. Which cheese ranks higher in the market?—There is very great difficulty in getting Cheshire cheese at the present time, but Cheshire cheese fetches a high price in the market comparatively.

2799. Then, as a matter of fact, Cheshire cheese ranks higher in the market, notwithstanding the fact that it contains more water and less fat?—That is on account of the peculiar quality and of the peculiar mode of preparation.

2800. What fixes the value of Cheshire cheese?—The public taste.

Sir *Mark Stewart.*

2801. Is it not the fact that Cheshire cheese comprises that whole product of the cow, the cream, the milk, and everything else?—Yes.

Mr. *Kilbride.*

2802. Then, as a matter of fact, although the public give more money for Cheshire cheese than for American cheese they are prejudiced in their purchase, because it contains more water?—They do not take that standard; they take another standard altogether. They buy it as Cheshire cheese; they do not buy it on account of the water that it contains.

2803. Then why do you fix this arbitrary standard of 16 per cent. of water in the pickled butter that comes from Ireland?—I am very sorry that it should apply in that way, but there

Mr. *Kilbride*—continued.

is no doubt about it that when you come to ordinary butter containing such a large percentage of water it is to the prejudice of the purchaser to sell such a butter as ordinary butter.

2804. You state as a fact that the reason why there is less water in American cheese is that it is made by a different process from that of Cheshire cheese?—Yes.

2805. As a matter of fact, the Irish butter is made by a different process from that by which Danish butter is made, and it would be only natural to expect that it would contain more water than Danish butter does?—But the misfortune is that the public expect that the Irish butter should contain the same quantity as the Danish butter. In the case of Cheshire cheese and American cheese, they buy the Cheshire cheese because it is Cheshire cheese, and they buy the American cheese because it is American cheese; they do not compare the one with the other.

2806. What evidence have you that the public desire to have only 16 per cent. of water in Irish butter?—The evidence that I have is that you want always to get as much value for your money as you possibly can.

2807. According to that the public desire only to have 16 per cent. of water in Irish butter because they want value for their money. Then how comes it that they are willing to give a very much higher price for Cheshire cheese than they will give for American cheese, although they will not be getting value for their money?—That is a matter of taste; we cannot do it by chemistry. That is a matter of opinion.

2808. Why do you allow the public taste to fix the quantity of water in Irish butter; why do you establish that standard?—I am entirely opposed to establishing a standard. I believe that ordinary commerce will settle the water question for itself.

2809. That is the point. You are satisfied that there is no such thing as a standard of water in Irish butter?—I have answered that question before in that way. I believe myself that it will soon be settled commercially.

2810. Do you think that the public taste ought to be allowed to settle these things for itself?—I think that that is scarcely for me to answer.

2811. Was it you or Mr. Thomas who spoke about some instructions that were sent from Somerset House to Dublin Castle in this connection?—I think I spoke about that.

2812. The letter was from the Chief Secretary, I think?—I will read you an extract from the reply.

2813. What I want to know is what instructions were sent?—I have the letter here; I will read an extract from the letter. It is an extract from a letter sent to the Under-Secretary for Ireland in reply to inquiries respecting the adulteration of butter by the addition of water; it is dated the 23rd March, 1893: "The conditions, however, of butter manufacture, are such that a reasonable limit for water in commercial butters may be indicated, taking also into consideration the results of numerous analyses of fairly-made samples. Such a limit might be found at 16 per cent., though in practice an

Mr. *Kilbride*—continued.

excess over this figure, amounting to fractional parts of 1 per cent., would not necessarily become the subject of proceedings. I do not suggest 16 in the nature of a standard, as it is obvious that if it could be proved that any water had been added to a made butter, an offence may be held to have been committed, though the total amount did not reach 16 per cent. If in any case where the amount exceeded 16 per cent., it could be shown that the undue proportion of water arose from want of skill in the manipulation of the butter, and that there had been no intention to defraud, it would, in my opinion, be a question for the magistrates to consider whether the defence was a valid one or not."

Mr. *Frye.*

2814. Are you in favour of coffee and chicory being sold as a mixture so long as it is described as such?—Yes.

2815. Would you be in favour of a mixture of butter and butterine being sold as a mixture?—But what is it to be called; because I think I have explained before there is rather a difference between coffee and butter mixtures.

2816. A butter mixture?—In the face of the present legislative enactments I think it would be better to leave the matter exactly as it is.

2817. Is it not the fact that in the case of cocoa and starch, and sugar, the mixture is allowed to be sold as chocolate powder?—It is.

2818. Do not you think it is a hardship upon the manufacturers of margarine and butter mixtures that they have to sell their product as margarine, and not as a mixture?—There is no doubt it is not logical, but at the same time it is the law.

2819. Does it not strike you that there would be less incentive to adulteration if it were sold as a mixture?—I think at the present time, when you consider the conditions of the market, and everything connected with the sale and of the supply of margarine, it will be very desirable for you to go on on the present system, and to have no changes of any kind which would upset trade.

2820. In your evidence of last Wednesday you stated that the imports of margarine were increasing?—Last Wednesday but one I think it was.

2821. Would you refer to your statistics and inform me what the imports were of margarine in weight and value in the year 1887?—In 1887 the importations of margarine in weight and value were 1,276,140 cwts., and the value was 3,880,327*l.*

2822. Now give me last year's, 1893?—In 1893, 1,300,033 cwts., and the value 3,656,224*l.*

2823. Does not that show that the imports of margarine remain stationary?—I think that is scarcely a fair way of putting it, and I will tell you why; because on the 1st of January 1888 we have the Margarine Act coming into operation, and it followed as a matter of course that in 1887 the importation would very likely be increased; and thereupon when I said that there had been an increase, I took those two together for the purpose of what I consider a fair comparison. But the increase altogether is this: the

Mr. *Frye* —continued.

margarine increase from 1888 to 1893 is 10·1 per cent., that is, taking the average for the number of years, 1·6 per cent. per year; and of butter in the same period, 1888 to 1893, there was an increase of 39·3 per cent., or an average of 6·5 per cent. per year.

2824. And from 1887 butter has increased about 50 per cent.—Rather more than that.

2825. Mr. Preston Thomas in his evidence told the Committee that the separator skims the milk much more completely and takes the solids much more completely than by skimming. Is not this a mistake; does not the separator take out the fat and not the solids?—It takes out the fat and not the solids not fat. I daresay Mr. Preston Thomas meant that it diminished the amount of total solids in the milk.

2826. In your analysis of condensed skimmed milk, do you not find a percentage of fats still left and all the other solids left?—Yes; there is always a small percentage of fat left.

2827. Is not the process of manufacturing condensed skimmed milk the driving off water and the addition only of sugar?—Yes.

2828. Does not the addition of sugar to skimmed or separated milk replace to some extent the fat extracted, inasmuch as it supplies heat-producing qualities?—In its physiological effect, yes.

2829. Is not condensed skimmed milk sold in tins bearing labels describing it as skimmed?—Yes.

2830. Has it not been held that this was a proper and sufficient notice to the purchaser of the alteration in the article?—Yes; the prosecution, I think, was really on account of the small quantity of fat that was shown to be in the separated milk; and I think the prosecution was undertaken because that calling it skimmed milk did not properly designate the particular kind of milk, that it ought to have been called separated condensed milk. But when the case came before the higher courts they ruled that it was simple nonsense to make a distinction. It seemed to me a waste of money altogether to go on with such a prosecution.

Sir *Mark Stewart.*

2831. In regard to margarine, can you give the Committee any evidence as to its taste?—As it is without any admixture of butter, do you mean?

2832. Yes, margarine pure?—It tastes very pleasant; it does not taste like a hard fat at all, because it had been worked up with milk.

2833. Is there any resemblance to dripping?—No, not at all; it does not granulate.

2834. There is a question to which I should like to call your attention in the Report of the Select Committee on Butter Substitutes for 1887, at Question 47, which Mr. Gurdon put to Sir Frederick Abel: "Is oleomargarine by itself in an adulterated state perfectly wholesome?—(*A.*) Yes, if it is prepared from carefully selected and sweet fat. (*Q.*) And is it palatable to the taste?—(*A.*) It is not unpalatable; with salt it would be very similar to dripping without the flavour peculiar to the roast meat from which the dripping has been prepared." That is oleomargarine?—But this margarine derives a flavour from being worked up with milk, so it gets a flavour in that way. It is altogether different from dripping. You have to be careful that it does not granulate like dripping, because if it does its commercial quality is impaired very greatly.

Sir *Mark Stewart*—continued.

2835. Has margarine undergone any difference in manufacture to make it more palatable do you suppose since 1887?—Yes, there has been great progress made since then in its manufacture.

2836. You do not consider that it is any way injurious to health?—Not the slightest.

2837. It is a perfectly wholesome commodity?—It is a perfectly wholesome commodity, so long as it is made from sound materials.

2838. And you also stated fully that the colouring matter is in no way deleterious?—That is my opinion.

2839. I want to ask you a question in regard to separated milk, and the answer which I think you gave to Question 648; you were asked: "Can you give the Committee any information as to the nutritive value of separated milk"? and the answer you gave was: "The nutritive value of separated milk is high; what you want in connection with that is an addition of fat; and it is a capital thing for bone and tissue"?—Yes, because the fat that is taken away from the separated milk is really for the purpose of giving fat, a heat-giver, to the body; but when you come to what is left in it, that is for the purpose of building up the body in the way of bone and tissue.

2840. That is practically not of much account to infants and young children?—The reduction in fat is not of much account to a young child; it would be to infants, because an infant could not get food from any other source than milk; but to a young child you can give milk plus the fat it gets from something else in its diet.

2841. So that separated milk would not be a bad diet for a young child?—No, and for another reason too; because the separated milk at the time of condensation is perfectly sweet, and skim milk is not; therefore it would be fit for children, while skim milk might not agree with them.

2842. So that it might be really fit for children if other food were given in addition, to make up the total fat?—Yes.

2843. You stated that the cheese which contained the greatest quantity of water was Cheshire cheese. Do you know how Cheddar cheese stands with regard to Cheshire cheese?—Cheddar cheese is lower; that is a tough curd, because the curd has been heated when being made into cheese. I can tell you in a moment. The Cheddar is 35·60, that is a little under the Cheshire, but very little.

2844. Cheshire was 37?—37·11.

2845. Cheddar cheese also contains the whole product of a cow, does it not?—Yes, it should do so.

2846. Did you make any suggestion in regard to any popular kind of milk tester such as a farmer could make use of without knowing much about chemistry?—Yes; if the farmer would do two things, take the density of his milk and also take the quantity of the cream, that would assist him

Sir *Mark Stewart*—continued.

him materially in seeing how he was getting on with his milk produce; but the misfortune is that they very often use a tester and they do not read off the quantity of fat; and it follows, as a matter of course, that if you get a milk that contains no fat, the specific quantity is higher than in a milk containing a large quantity of fat.

2847. How would he test the milk after having taken off the cream?—What he would do would be this: he would have a little lactometer for the purpose of taking the specific gravity; he would then have some long tubes which should be kept at a certain temperature, marked at the top, giving the percentage of cream or fat.

2848. After the cream is taken off?—No, the whole milk; all would be put in the tester and it would keep rising.

2849. In regard to analysing milk, I suppose you naturally would not incline to that being taken up by the Board of Agriculture in respect that it is an agricultural commodity rather than that it should remain at Somerset House?—It is rather curious, but we are connected with the Board of Agriculture as well as with the Local Government Board, and do the chemical work of each department.

Mr. *Channing.*

2850. Both as regards these Acts and as regards the Fertilizers Acts?—Yes.

Sir *Mark Stewart.*

2851. Would you recommend more inspectors being employed or more inspections taking place?—My opinion is that if you take your present Act and work it out in detail, that is enough for the public protection.

2852. Do you mean the present Margarine Act?—The present sale of Food and Drugs Act. If you take that and work it out in detail, and compel local bodies to have their analysts and inspectors, and have the Act carried out rigidly, there would be very little difficulty in the supply of pure food to the consumer.

2853. You rather imply a censure on the local bodies for not attending to that?—It is practically impossible for you to do much good in that direction, because if you get one end of London, where they are very diligent in carrying out the regulations of the Sale of Food and Drugs Act, and in the next parish they do nothing, it follows as a matter of course that adulteration must go on.

2854. In regard to a systematic method of analysing, what do you say upon that point?—Do you mean of milk?

2855. Milk and margarine and dairy products?—I think that, so far as systematic examination of milk is concerned, we have got almost to that point at the present time. There is very little variation in the examination of milk samples, I think.

2856. My impression was that if you sent to different chemists very often they arrived at very likely the same conclusion, or practically the same conclusion, only by different methods; whilst some, on the other hand, arrived at different conclusions, and in consequence did not give satisfaction to those who consigned samples to them?—There is no doubt that there have been great difficulties in the way of milk analysis; but at the same time, when we get competent

Sir *Mark Stewart*—continued.

chemists examining a sample of milk, even although they examine the sample by the coil process, or whether they examine the sample by the maceration process, the differences between the two will not be so great as the differences are very frequently between two different operators working on the same system. Thus, for instance, I will give you a case in point. I have some figures before me obtained by nine public analysts and Dr. Vieth; they examined two kinds of milk, one containing a large quantity of fat and another containing a small quantity of fat. These milks were sent from one particular source, and the samples of milk were examined at the same time and under the same conditions. When we come to look at the total solids, we find between the ten different operators the following differences: The highest 15·07, and the lowest 14·76, that is a difference of 31–100ths per cent.; in the fat, the highest was 6·71, and the lowest 6·20, giving a difference of 51–100ths per cent.; in solids not fat the highest was 8·62, and the lowest 8·08, giving a difference of 54–100ths per cent. In the poor milk, of the total solids the highest was 9·87, and the lowest 9·43, giving a difference of 44–100ths per cent.; in the fat the highest was ·83, and the lowest ·29, giving a difference of 54–100ths; in the solids not fat the highest was 8·95, and the lowest 8·14, giving a difference of 81–100ths. Now, expressed in percentage of adulteration, the difference in the rich milk in the solids not fat would be 54-100ths of 1 per cent., or equivalent to 6 per cent. of water; in the fat the difference would be 51–100ths, or an abstraction of 16 per cent. of fat on a 3 per cent. limit. In the poor milk in the solids not fat the difference would be equivalent to 9·5 per cent. of water, and of fat 54–100ths, or 18 per cent. abstraction of fat, if the fat limit be 3 per cent. Now those experiments were made as carefully as they could be made by the operators, and we can easily see that the difference is very great; so when we come to look at ordinary analyses at the present time we find that the analysts, when working against each other, will come far below those limits referred to.

2857. When was that taken?—In 1885.

2858. And science has progressed since 1885?—Yes.

Mr. *Channing.*

2859. Have you Dr. Vieth's figures separate from the rest; you mentioned his name separately?—If you will allow me I will put this table in altogether; because in the first part it is an extract from an adjourned discussion on the report of the milk committee in the "Analyst" for 1886, Vol XI, pp. 62 and 63; and then on the same page you have another examination of milks, and you will see there about what the differences are. If you would like to have that paper I will hand it in. (*The Witness delivered in the same.*)

2860. Just one more question: in your experience is there much inferior margarine sold?—I am not able to speak of that, because the inferior margarine is sold in low districts, and I am not acquainted with those districts.

2861. It does not come under your observation

Mr. *Channing*—continued.

at Somerset House?—I see a large quantity of margarine, but it is of better quality.

2862. Is that generally imported from abroad, or manufactured in this country?—From abroad.

2863. What is the caseine in the milk?—That is the curd.

2864. What are the ingredients composing it?—I scarcely understand the bearing of the question.

2865. My point refers to cheese-making, and I rather wanted to ask you what is the principal matter in cheese-making?—The curd is the nitrogenous matter that builds up the tissue of the body.

2866. What is the principal matter in the milk that produces cheese?—I think, from a cheese manufacturer's point of view, he likes a milk that contains not too much fat, because it is rather difficult to work if it does, and he also likes a milk that does not easily throw up fat; that is to say, that the fat globules shall not be very large and the fat remain throughout the milk.

2867. Where does the caseine come in there; in the ingredient of milk?—It comes in the curd.

2868. Which is the most useful part for cheese-making?—Yes.

2869. But not for butter-making?—It ought not to be there; if you have caseine in butter it follows, as a matter of course, that it will soon begin to decay.

Mr. *Colston.*

2870. I suppose that is why sometimes the very best cheese is made off inferior lands?—Exactly; it keeps better; it matures better.

Sir *Mark Stewart.*

2871. Is there anything else that you wish to say?—There is one matter that I wish to bring before the Committee, if you will allow me. A fortnight ago I told the Committee that I had written to France for information about milk limits or standards in Paris. I have that information here, if you can give me time to detail it.

REGULATIONS in Paris for the Milk Supply.

To prevent or detect adulteration.

1. The determination of the nutritive value of milk and the various questions relating to the milk trade are reproduced in the document of the Municipal Laboratory, 2nd Edition, page 358.

2. The average composition of the milk sold in Paris is:

Total solids 130 grammes per litre, which must contain at least—

Butter (fat) - -	27 grammes.
Lacteur (milk sugar)	45 „

The proportions of these substances worked into percentages by weight (assuming the specific gravity of milk to be 1030) would be:

Total solids - -	12·62 per cent.
Butter (fat) - -	2·62 „
Lacteur (milk sugar)	4·36 „

Sir *Mark Stewart*—continued.

3. The practice in the Laboratory, based on the conclusions of the Council of Hygiene, is to calculate milk dilution on the basis of 130 grammes of extract per litre, and skimming (*i.e.*, removal of cream) at 40 grammes of fat per litre. (This standard would be, in percentages by weight: Total solids, 12·62 per cent.; fat, 3·88 per cent.) Thus the minimum milk with 115 grammes of extract (which represents 11·16 per cent. of total solid) as found by the Commission of the Council of Hygiene represents the standard milk diluted 11·5 per cent.

4. Samples of milk from cows of Dutch breed have been found in the Laboratory to contain as low as 108 and 110 grammes of extract per litre (representing 10·48 and 10·68 per cent. of total solids by weight.)

5. It has to be admitted that dilution can only be detected by a retailer from the external characteristics of the milk when it exceeds 15 per cent., and that below this percentage his *bona fides* cannot be impugned. Consequently, as the law punishes not only adulteration, *i.e.*, the addition of water, but also the possession of articles known to be adulterated, this Laboratory only advises prosecution for dilution in cases where this exceeds 19 per cent. on the standard milk, that is cases in which the extract is reduced below 105 grammes per litre (representing 10·19 per cent. of total solids by weight). We therefore pass commercial milks which do not fall below the above-mentioned limit of 105 grammes of extract, 27 grammes. of fat per litre.

This limit would be—

10·19 per cent. of total solids by weight, including 2·62 per cent. of fat.

7·57 per cent. solids not fat by difference.

The percentage of fat is only taken into account in estimating the quantity of water added, and of cream removed in the case of known classes of milk, that is, of milk as generally sold.

6. Whenever possible the source of fraud is sought by taking samples either from the stocks of itinerant vendors, at the railway stations, or from the dairy company's depôts. Besides this, whenever milk on sale supplied from farms in the Department of the Seine is sampled and found to contain less than 130 grammes of extract, and 40 grammes of fat, samples are taken from the farms direct from the cows, and careful note is also taken of their food and breed.

7. The methods of analysis employed are described in the "Documents of the Laboratory," and more recently in the work published by Dumod & Vicq in Frémy's "Encyclopedie Chimique," entitled "Analyse des matières alimentaires."

This work gives a description of methods employed in the analysis of butter. In the estimation of margarine are used the processes of Köttstorfer and of Reichert-Meissel, one against the other, basing results on the mean of the indications.

2872. Is

Mr. *Frye.*

2872. Is there not more information to be obtained?—Yes.

2873. Had we better take it all together?—If the Committee will allow me I will hand it in, because it is most valuable information.

Sir *Mark Stewart.*

2874. I think you undertook to bring it to an honourable member of the Committee?—I undertook to bring it to the Committee itself.

Mr. *Channing.*

2875. Could you put upon the notes of evidence the essential point of what the standard is?—If you will allow me to do so, I will prepare a paper that can be handed in. Then there is another matter. On Wednesday last I was asked two or three questions, one of which was about the Merthyr Tydvil vinegar case, and another about the Derby milk case. I think Mr. Kearley asked me about the Derby case; and I have the information for Mr. Colman to-day about the Merthyr Tydvil case.

Mr. *Colman.*

2876. Will you read it now or will you hand it in?—If it is agreeable to you I will prepare a paper and hand it in in the same way.

2877. Have you any opinion as to whether in future legislation it would be well to separate food from drugs?—I think there is no difficulty at the present time in working them together.

2878. There is a standard of purity for drugs necessarily; there may not be for food; but I ask the question; you do not think that there is any need for separating them?—I think there is not the slightest difficulty in working them together now.

2879. Do you know anything about the Act of 1872?—Yes, I know about the Act of 1872.

2880. The reason of the alteration recommended by the Committee that sat afterwards, I think, was because there was a good deal of complaint as to the way in which the Act of 1872 affected traders?—There is no doubt that at that time, in the two years between 1872 and 1874, the analytical knowledge of the composition of foods and drinks was small, and there is no doubt also that prosecutions were instituted which were very tyrannical, especially as to the facing of tea, which so incensed the different merchants that there was such an agitation against the working of the Act that at last the Government were compelled to have a Committee of Inquiry; and out of that Committee of Inquiry of 1874 we had the Sale of Food and Drugs Act of 1875, under which Act we first had reference cases.

2881. Somerset House really, practically, became the referee out of the Committee of 1874?—Exactly.

2882. You told the Committee some time ago that you had 23 samples of lard referred to Somerset House; do you know at all in how many instances you disagreed with the certificates sent up with the Report?—I can tell you in a moment. In the case of lard we had 12 agreements and 10 disagreements, and one sample was sent up not for a case of prosecution.

Mr. *Colman*—continued.

2883. In those disagreements there was some particular point of disagreement common to the whole of the samples?—The disagreement generally was as to the presence or absence of beef stearine in the lard.

2884. Is there much difficulty in distinguishing beef stearine in lard?—There is considerable difficulty in distinguishing beef stearine.

2885. In your opinion is the use of a moderate quantity of beef stearine, say 10 per cent., for the purpose of stiffening lard, an adulteration?—At home in the summer we always used to put a small quantity of mutton suet into the lard to keep it hard, and make it convenient to work for domestic purposes. But there is another point in connection with the addition of stearine to lard, which has to be considered. There is no doubt that some time ago a large quantity of lard that came from America not only contained beef stearine on the one hand to harden it, but contained cotton seed oil on the other hand as an adulteration; and a very large quantity of that adulterated lard came into this country with the addition of cotton seed oil. Now, I very seldom meet with that at all. At Chicago they have taken the matter up very strongly, and that is now under the control of the Chicago Board of Trade. At the present time the chief disagreement as to the adulteration of lard is on the assumption that beef stearine is present in the samples. In many cases that we have had we were not able to confirm the conclusions of the analyst in that particular.

2886. In other words, in some of the cases beef stearine was in, and you did not consider it an adulterant?—No, not so; in some cases we did not find beef stearine in the samples; they were sent up as adulterated with beef stearine, and we could not find beef stearine present in those samples.

Mr. *Channing.*

2887. Just one or two questions on this particular point. You speak of the referees disagreeing with the analyst, but they may be said, may they not, to agree with the analyst, even where they find a minimum proportion of water in milk which is lower than what the public analyst has certified?—That would be an agreement.

2888. Where they specified a lower amount?—Yes; the disagreement would be as to the percentage, but there would be a distinct agreement that added water was present.

2889. You would describe that as an agreement?—Yes.

2890. Are you aware that a case was recently dismissed owing to the magistrate noticing the difference between the percentage of water certified by the public analyst, and that named as probably present by the referees, that therefore the prosecution was dismissed?—That might be so, but I should like to know all the particulars of the case. If the magistrate did dismiss the case I think it would be rather a high proceeding for him to take in such a case.

2891. It is my information that such a case was dismissed. Would that make it desirable, in

Mr. *Channing*—continued.

your opinion, that the statement of the percentage by the referee should be more precise?—We are as precise as we can be in the examination of the sample.

2892. Do you think it precise when the public analyst certified to 10 per cent. adulteration, and the referee certified to not less than 4 per cent. of added water, an enormous difference?—Yes, one says 10 per cent. of adulteration, and the other says not less than 4 per cent. of added water. It may be more than 4 per cent., but we swear to 4 per cent. of added water.

2893. Why cannot the referees come nearer to the actual proportion?—The first question is whether the results obtained by the public analyst were sufficiently exact to justify him in saying that there was 10 per cent. of adulteration.

2894. You had not the case yourself?—I should like to have the figures, but so far as regards the figures that I have read out lately in the paper which I presented to you, you would see that so far as the differences between the public analysts themselves are concerned, the results which they obtained from an analysis of the same sample were quite sufficient to cover the difference between 4 per cent. of water and 10 per cent.

Mr. *Channing*—continued.

2895. As to the alleged increase in butter imports, you are aware that that is widely attributed to the vast increase of adulteration in France, is it not?—I believe that during the last year or two the amount of adulteration in France has considerably diminished on account of the stringency of their laws.

2896. Still, is it not your opinion that there is a very large amount of this adulterated butter which, practically, if it were inspected properly at the ports of entry, would be found to be legally described as margarine?—I should not like to say for certain, from the information that I have. I could not answer that in the affirmative.

2897. I have only one more question to put to you. You were asked about the relative digestibility of margarine and butter; is it not the fact that in margarine there is a much larger proportion of insoluble fats?—There is.

Friday, 27th July 1894.

MEMBERS PRESENT:

Colonel Bagot.	Mr. Frederick Frye.
Mr. Dunbar Barton.	Mr. Herbert Gardner.
Sir Charles Cameron.	Mr. Jeffreys.
Mr. Channing.	Mr. Kilbride.
Mr. Colman.	Sir Mark Stewart.
Sir Walter Foster.	Colonel Warde.

SIR WALTER FOSTER, IN THE CHAIR.

Mr. JAMES LONG, further Examined.

Chairman.

2898. I THINK when we left off at the conclusion of your evidence last Friday the question of margarine cheese was to be dealt with?—Yes.

2899. You would enforce the branding of all such cheese, would you not?—I think it should be compulsory upon a manufacturer of cheese containing any fat other than butter fat to brand it, and I will suggest a brand of one and a-quarter inches by seven eighths of an inch, not merely stencilled upon the cheese, but impressed with an iron.

Mr. *Frye.*

2900. Would it hurt the cheese very much?—No. That question arose last year at the Conference of the British Dairy Farmers' Association in Somerset. The American cheeses, and Canadian cheeses, come over with stencilled brands, and I suggested to some of the shippers in Montreal that they ought to use for their own protection such a brand as I suggest to-day; but the objection was that it would damage the cheese, although they told me at the same time that the stencilled brand was rubbed or scraped off upon the arrival of the cheese at Liverpool by the importers who absolutely charge for the process of scraping it off. Then at the conference I suggested that there should be an example of the impressed brand, and it was decided by the Committee that the cheese made by one of the skilled makers, Mr. Cannon, made upon the day of our arrival at his farm, should be retained for exhibition at the Dairy Show in October, and that it should be branded in the manner I suggest. It was branded and with perfect success.

Chairman.

2901. And the cheese was not injured?—Certainly not.

2902. Would you also brand British cheese?—I would not suggest that there should be any law upon the subject; that is merely a suggestion in passing for the protection of the farmers themselves, who, following the example of the New York State farmers, would enhance the value of thin cheese by branding it in some such form as the New York State farmers do. "Full cream cheese," or words to that effect.

Chairman—continued.

2903. What is the practice in Canada?—There is a similar practice in force in Canada.

2904. You in fact propose that cheese made from margarine should have the same legislation applied to it that you would apply to margarine butter?—I think it should.

2905. You put them upon the same level?—Yes.

2906. Both being products of the same variety of fat, you would have them treated in the same way by the Legislature?—I would.

2907. With a view of protecting the public from having a spurious article foisted upon them?—Yes, and the farmers or producers from unfair competition.

2908. Is there much manufacture of margarine cheese in England that you know of?—I cannot give any specific evidence upon the point, because there is a reticence upon the part of those connected with the trade to give it; but I do know of two instances in which it is made upon a large scale. I am afraid I cannot say any more than that.

2909. That is to say, cheese is actually made from margarine, instead of from milk on a large scale, within the United Kingdom?—Yes.

2910. Can you account in any way for the deterioration in quality of cheese during the last few years, if there be such deterioration?—On the contrary, I think that British cheese has increased and improved in quality.

2911. You think it has?—Undoubtedly.

2912. And that the competition with foreign cheeses has probably brought that about?—Undoubtedly, to some extent it has; but it is possibly owing to the teaching, and, undoubtedly to the demand for teaching, that has arisen from foreign competition.

2913. Has there been an equal, or even a greater improvement in foreign cheeses in that time,

Chairman – continued.

time, or in imported cheeses?—The Americans, the Canadians, and the Australians, who are our greatest competitors, are striving with their utmost might and main to maintain their position in our market, and to improve their cheese as we are.

2914. And so far they are succeeding, are they not?—They are succeeding in improving their cheese, but I do not think that they have any chance of equalling our best makers on account of the distance over which the cheese has to travel.

2915. Can you tell the Committee anything bearing upon the point of the localised manufactures of special varieties of cheese, for example, Stilton?—In what way?

2916. Stilton cheese is not a cheese made in one particular place, I understand?—It is chiefly made in Leicestershire, and in the neighbourhood of Leicestershire.

2917. Is that the original seat of its production?—That is the home of the cheese.

2918. And it is principally made there still?—It is.

2919. Is it imitated in other districts, and sold as Stilton?—Stilton cheese is made in other districts, but it is not an imitation, I should take it, but quite as good.

2920. Then you think that various localities in England which have been celebrated for their cheeses, have, up to the present time, maintained their position?—They have. Other localities have made the same kind of cheese with equal success.

2921. But each of these old seats of production is still keeping up its manufacture?—Yes.

2922. Is it increasing it, do you think?—I think it is, both in quantity and quality.

2923. So that the home producer is really producing more cheese now in those various localities than formerly?—I believe so.

2924. And cheese of better quality?—Yes.

2925 Has the price altered very much?—This summer the price of cheese has fallen, but until now there has been no material change in the price, which has been maintained. There has been a distinct fall this summer.

2926. And in that respect, with the increased production, with the superiority of quality, and with the maintenance of the price, this particular branch of agricultural produce has not suffered very much?—By no means so much as other branches of agriculture.

2927. So that cheese production has been a profitable work for the farmer?—One of the best on the farm.

Mr. *Frye.*

2928. Has the price of Cheshire cheese very much increased this last year?—At the present time Cheshire cheese has fallen materially in value.

2929. Last year did it increase?—It was a very good price last year.

2930. The highest price ever known, was it not?—I think it would not be too much to say so.

Chairman.

2931. Have you anything else that you wish to bring before the Committee?—There are one or two points arising out of my evidence of last week.

2932. Have you any supplementary remarks to make with regard to your evidence?—I have a few.

2933. Will you proceed with them?—I have got two or three answers with me in reply to questions which were put to me last week. One was with regard to the percentage of individual cows whose milk fell below the standard which I suggested. I would point out that this percentage can be obtained from the evidence which I have given as to the quality of milk obtained from various sources; but I have one example which I would like to quote, as I think it is a fair example of what can be found in very many cases. This is from the herd of the Royal Agricultural College Dairy, and although of course the milk, with this exception, is of very high quality, this particular cow gave solids not fat equal to 7·28 per cent. only. I thought that would be a case in point.

2934. Have you the fatty solids?—Yes, 3·27 per cent.

2935. The fatty solids were then fairly up to the standard?—Yes.

2936. And the total solids were considerably below the standard?—Yes, the solids not fat were quite abnormally low.

2937. Was there anything about the feeding of that particular cow that was peculiar?—No, they were all fed upon the same kind of food, which is here given: "The cows received from 30 lbs. to 40 lbs. of roots, 14 lbs. to 16 lbs. of chaff, and 3 lbs. to 6 lbs. of meal."

2938. How long had that cow calved?—On January the 26th, and this milk was taken on December the 12th in the same year, so that is about 11 months.

2939. Would that have any influence on the peculiar character of the milk?—Any influence which would occur in this case would be to improve the quality of the milk rather than to depreciate it.

2940. Then you can only refer this milk to the peculiarity of that individual cow?—Exactly.

2941. That is the point which you wish to bring out, is it?—I wish to bring out the point that out of 18 cows one only gave milk of an abnormally low quality. I think that is a very fair example, although it is most unusually abnormal.

2942. Is there any other point that arises out of your evidence which you wish to refer to?—I was asked with regard to the milk of Scotch cows, and I referred to Ayrshire cows, but I omitted to mention that my reference was taken from a very large northern factory of milk, which consists of 90 per cent. of Ayrshire cows, and that it was considerably above the standard proposed. The next question was with regard to condensed milk. I was asked to give the size of the letters which I suggest should be half-inch square upon the label.

2943. On

Mr. *Frye.*

2943. On the tin?—Yes.

2944. Would there be room on a small tin?—On a 1 lb. tin there would.

2945. But then there are very small tins of condensed milk now, are there not?—I cannot tell you.

2946. There are quarter tins, are there not?—I do not know the technical term, but they hold a pound.

2947. Would you reduce the size of the letters on those little tins?—I think that would be quite as small as you could make them. I was also asked with regard to the Danish exportations, and I gave them to show the great progress of the butter trade in Denmark between 1878 and 1885; but in case that may convey a wrong impression, I refer to the fact that in 1892 the actual import of Danish butter amounted to 96,000,000 lbs.

2948. Have you any other point that you wish to refer to?—The next point is with regard to the proposed French Bill. I have taken the three salient points, one of which is that it is proposed to prohibit the sale of margarine and butter on the same premises by the same people; the next is that it is proposed to fine defendants convicted, from 20*l.* to 200*l.*, or to give them from three months to two years onwards, imprisonment; and the third point is that it is proposed to publish the conviction in three journals, also in the market place, and also on the premises of the defendant, at the defendant's cost.

2949. Have you any other points beyond those?—There is one point. It has been suggested to me that my evidence reflects upon chemical analysis. In suggesting that there should be a Dairy Bureau, I had in mind the fact that such an authority would select those who are most competent by their experience in this particular line of analysis, and I merely wished by my evidence to suggest that every chemist cannot be, and is not a skilled analyst as regards butter and margarine, and that only those who are really skilled are persons whose evidence is worth accepting in a case in which a man is placed upon his trial. I did suggest, and I maintain at the present time, that below a certain point it is morally impossible to guarantee that butter contains margarine.

2950. Have you any other facts that you wish to place before us arising out of your evidence on Friday last?—In proof of this last assertion which I have made, I should like to quote one of several other facts that I could give, and this fact is that I myself prepared a mixture of margarine and butter; the mixture was sent to two analysts for analysis, and in order that there might be no dispute, the margarine itself. I should state that I mixed the margarine with the butter at the rate of 16½ per cent. One analyst returned the mixture as pure, and the other said that of the fat present in this sample 75 per cent. was butter fat, and 25 per cent. other than butter fat.

2951. You give us those examples as illustrating the difficulty of analysis, and the variation that competent men may obtain in their results?—Hardly so. I give you the instance to show

Mr. *Frye*—continued.

that the practitioner, who, I take it, has had considerable experience was very near the mark in one case, whereas the practitioner who has had little experience was very wide of the mark, indeed.

2952. Then your point would indicate that a chemist who was not used to these analyses ought not to be employed?—That is the point; not that he cannot do it if he is experienced.

Colonel *Bagot.*

2953. Was the analyst who gave the result as pure a chemist and the other man an analyst?—They were both analysts.

2954. What was the difference between them?—There is no difference; they are both supposed to be skilled analysts, but in the one case to my knowledge one gentleman has been constantly making analyses of margarine and butter, and, so far as I know, the other has not.

2955. And the gentleman who is constantly in the habit of making analyses was the man who returned 25 per cent.?—Yes.

Chairman.

2956. In his return he returned an excess over what you had introduced?—Exactly.

2957. So that that bears upon the point, to some extent, of the difficulty of relying very precisely upon these analyses?—It shows that below the figure that is very often taken by chemists themselves, 20 per cent., you cannot tell with absolute certainty, or within a few per cent.

2958. You had taken, I hope, in this case all possible precautions to diffuse your margarine equally through the sample?—Every possible precaution. I am quite convinced that the most experienced analysts with regard to this particular material, are to be absolutely relied upon when you have such a mixture as is usually made by persons who intend to make a profit by fraudulent means.

2959. What is the standard of that mixture?—From 25 per cent. upwards, I should say.

2960. Twenty-five per cent. or upwards of margarine would be detected with accuracy, you think?—I think 20 per cent. and upwards would be analysed with fairly accurate results.

2961. Have you anything else that you wish to say?—I was asked with regard to water in butter. I had not the photographs by me last week, but I have brought them to-day that the Committee may see them (*handing in the same*).

2962. These photographs are to illustrate the different appearances of water in butter under different conditions?—Yes. In the one case, by very careful manipulation the water is shown to be present in small globules, and in the other case by more careless manipulation it is present in large globules, which can be seen upon examination of the butter by the eye.

2963. And I suppose you would repeat what you said last time, that water carefully diffused through butter would not be perceptible by the naked eye?—It would not be perceptible, although the butter might appear dry, and still

 contain

Chairman—continued.

contain a high percentage of water. I was next asked if I would give the details of Dr. Veith's analyses, and I promised to do so. Dr. Veith was for many years the chemist to the Aylesbury Dairy Company, and these figures are taken from 84,700 analyses of the milks of from 30 to 50 different farms between the years 1881 and 1888. The figures that I have taken are a digest of the whole of these analyses, and I think that they are some of the most valuable and conclusive in existence. They are taken by months. The total solids were never below 12·4 per cent.; they were twice as low only, and on those occasions in March and July 1881. The solids not fat were below 9 per cent. in 12 different months; they were assayed above 9 per cent. in all the later years after the first year; so that it appears to me that after the first year the farmers were cautioned, and they persistently improved their milk from that time henceforth. On one occasion only, in June 1884, the fat in the milk fell down to 3·4 per cent.; the average of the eight years being from 3·8 to 4 per cent. Therefore that company were enabled to obtain a supply of milk far above the standard that I propose from 1881 to 1888. I also took a few examples of individual farms, all being morning analyses. On farm A., consisting of 30 shorthorn cows in 1881–82, three times the milk fell below 12 per cent., but never afterwards; the fat fell three times down to 3 per cent., but never afterwards; and the solids not fat, on 41 occasions out of 96 were below 9 per cent. That confirms my evidence of last week. On Farm B., consisting of 60 shorthorn cows, the fat fell on two occasions to 3·2 per cent., the total solids were in every case from 12·2 to 14·2 per cent.; the solids not fat were 16 times below 9 per cent. On Farm C. of 35 shorthorns, the solids were always over 12·4 per cent, and these are all the morning analyses, while the fat varied from 3·3 to 4·9 per cent.; the solids not fat were often at or below 9 per cent. Then Farms D., E., F., and G. are very similar with regard to the results.

2964. When you say that they were morning analyses, they were morning analyses at the Dairy Company's, I presume?—I should explain that they were analyses of the morning's milk, which is always poorer than the milk of the evening.

2965. They were not analyses made of the morning's milk gathered the evening before?—I do not know when the analyses were made, but they were all of the morning's milk.

2966. Have you any other particulars that you wish to give us?—With regard to tracing the milk back to the cow, I think it should always be compared with the mixed milk from all the cows owned by the producer, whether it be one cow or 100, and not with the mixed milk of the morning and the evening, because that would be impracticable; the milk retailer cannot possibly, excepting in winter, sell to his customers, a mixed milk, because of the danger of its going sour, therefore you must take the milk as you find it. Accordingly, I suggest that it should be traced back to the original source as it is sold.

Chairman—continued.

2967. Do you mean to trace it back to the original cow?—To the original source, to the dairy; either to the one cow if the owner only owned one cow, or to the herd if he owned several; and upon that, in answer to objections that may be made, I would suggest that the salesman or retailer can always mix his milk in order to improve its quality with as great ease as he can mix it to diminish its quality. In the first place, in addition to mixing it with richer milk if he had it, he might mix with it some of the thin or adulterated cream that is commonly sold in the market just as easily as he can add water.

2968. What do you mean by adulterated cream?—I will take a case in point. I have myself sent cream to London for consumption in eating-houses and restaurants, and I have myself seen it (it was an accident in this particular case) mixed with milk to reduce its quality for distribution amongst the customers.

2969. Are you familiar with the very thick cream that is sold in London now in many places?—Yes.

2970. How is that thickness produced?—Generally by placing the cream on ice.

2971. It is not a question of the addition of foreign properties?—I do not think so. It has been mixed with gelatine, but I do not think that is any longer pursued, because ice is so much cheaper, and surer, and simpler. And I think, with regard to the objection of the farmer, that so far as the farmer is concerned, he can protect himself absolutely and entirely by the addition of cows giving richer milk.

2972. Are there any other points that you have to bring before us?—No I think not. I have figures here which are all a confirmation of the analyses that I gave last week, which are very abundant. Here, for instance, I have statistics of milk supplied to the Hampshire County Council for use in the dairy school, containing from 3 to 6·8 per cent. of fat, and so on. I have abundant materials showing the high quality of the milk obtained direct from the farm. I have a letter here from an analyst who says: "I know many will urge that the standard should be for total solids 11·5 per cent. A serious injury would be done to the public if such a standard were adopted; better remain as we are than have such a standard."

2973. A low standard of that kind would result in the deterioration of the quality of milk sold generally, would it not?—I think it would.

2974. That would be an injury to the public?—Yes.

2975. Whereas a higher standard than the one which you suggested would result in injustice to many importers of milk?—I think it might.

2976. So that the difficulty is in fixing a standard which shall protect the public on the one hand from general deterioration of quality, and save the individual supplier of milk on the other hand from unjust prosecution?—Quite so. I had this morning an interview with a very large milk merchant who supplies London shops. He did not know that I had given evidence, or

was

Chairman—continued.

was going to give evidence before this Committee, but he informed me that this question was being discussed by the trade, and he did not quite know, but he believed, by Parliament; and he said that if the standard were raised as it was proposed to raise it (I do not know what standard he had in view) he believed that half the milk now being supplied to London would be retained upon the farms; and he said that he himself should be afraid of every churn of milk that he sent out. I quote that, but suggest that it is quite a misapprehension. I say that by following the suggestions which I have made already the parties could protect themselves without any fear whatever. I have no fear at all as a producer.

2977. Have you anything further to say on any other subject?—I have here a letter from one of the very first analysts that we have, who suggests that 3·25 per cent. is not too high, and that the fat limit might even be raised still higher with advantage to the public; at the same time he is opposed to a legal standard; that is rather curious.

2978. Does he give any reasons for his opposition to a legal standard?—He gives indefinite reasons. One is, as I gather, that he would prefer the matter to be left to the analysts rather than to the Government.

2979. Is there any other point?—I was asked with regard to condensed milk as to the quantity of milk taken to produce a tin of condensed separated milk. It is 3½ lbs. of separated milk to make one tin of condensed separated milk; then there is about two-thirds milk and one-third sugar, so that the value of the milk (3½ lbs. being about a third of a gallon) would be about a half-penny, or a trifle more, *plus* the sugar.

Mr. *Frye.*

2980. What would it cost?—The value upon the farm is from 1*d.* to 1½*d.* per gallon; that is for feeding pigs or calves; there is no outlet at all for large quantities of separated milk in any other way.

Chairman.

2981. What would be the price of that quantity of milk as sold to the public?—I am afraid that when it is sold to the public it realises as much as new milk.

2982. You say that to produce a certain quantity of condensed milk, the given quantity that you have named of separated milk is used, and a given quantity of sugar. What do you say would be the total cost of producing that tin?—I think it would be under 1*d.* including the sugar.

Mr. *Frye.*

2983. Made of pure milk?—Pure separated milk and sugar.

Chairman.

2984. The retail price is what?—It varies from 3*d.* to 4*d.* in accordance with the quantity of fat taken off; 3*d.* is the lowest price with which I am acquainted, so far as the large tins are concerned; although there are half-sized tins sold at 1½*d.*

Chairman—continued.

2985. Then the tin of condensed milk which you refer to would cost 1*d.* to produce?—Under 1*d.*, that is excluding the tin.

2986. And would sell at 3*d.*?—It would sell at 3*d.* and upwards.

Mr. *Frye.*

2987. Then there has to be the labour, and the cost of carriage?—Yes, labour, carriage, and the tin.

2988. And boxes, and a good many other things?—Yes.

Chairman.

2989. Does that conclude your evidence?—Yes, that concludes my evidence.

Mr. *Jeffreys.*

2990. I should like to be clear as to what you think the standard of milk ought to be; did I correctly understand you to say that it ought to be 12·4 per cent.?—No.

2991. That was Dr. Veith's analysis, was it?—The first analysis by Dr. Veith with regard to the whole series of years, 1881 to 1884, showed that, taking the analysis by months, the total solids never fell below 12·4 per cent. My suggestion last week was that the standard should be 3·2 per cent. for fat and 12 per cent. for total solids.

2992. Are you aware that several witnesses have given evidence, and they have put the standard at 11·2 or 11·5 per cent. for total solids?—I am not aware of that.

2993. Do you think that a great deal too low?—I think it is ridiculous.

2994. Then the fear would be that a great many people with dairies with poor cows, that is to say, not rich milk-giving cows, would not be able to get up to this standard, would it not?—I think that the fear is quite groundless, because I have shown this morning, I thing, that the proportion of poor cows to normal milking cows is very small indeed, probably not more than the 1 in 18 which I quoted.

2995. Of course it is not everybody who is able to feed his cows as well as the cows in that dairy were fed. If the cows were fed upon such things as grains, and that kind of poor food, the milk is of a poor quality, is it not?—That is an undecided point. I think that no one who is an expert upon the question of dairy cattle would suggest for a moment that food has any important influence in increasing the per cent. of solids. Food will undoubtedly increase the quantity of milk, and hence the quantity of butter or cheese produced; but that milk is materially improved by feeding, there is nothing to show at all.

2996. Supposing that we fixed the standard by Act of Parliament at 12 per cent. as you suggest, would you prosecute anybody who sold milk under that standard, even if it were proved that it came direct from his cow?—I have already suggested that I would go back to the herd, or to the individual cow, if the owner owned only one cow; but in no case to a single cow if he owned more.

2997. But having ascertained that this milk which was below the standard of 12 per cent.

Mr. *Jeffreys*—continued.

came actually from this cow, or cows, would you still prosecute the man for selling it as an inferior article?—No, I do not think I would do so, if it was shown conclusively that the milk of the herd bore the same quality.

2998. The appeal to the cow, as the chairman says, would be good, and you would let the man off?—Yes.

2999. Then what would be the object of fixing a standard at all?—The object would be to compel people to produce milk of a higher quality.

3000. But, if in case it were proved that the milk came from this inferior cow or cows, the man should not be liable for any conviction, then what would be the use of a standard; it would not induce him to keep a better class of cow?—I quite see the point that you suggest. It would undoubtedly guard any provision of that kind very carefully with regard to the health and condition of the cattle, and the food that they received; for, although I do not believe that food has a material influence upon the quality of milk, yet a cow must receive sufficient food to maintain her condition, and hence her milk. Therefore, that point should be very carefully guarded against. I do not believe it would be found once in 500 times that a cow in health and properly fed gave milk anything like so low as the standard which has been suggested by the witnesses.

3001. Therefore, if the milk fell below the standard of 12 per cent., the farmer would be supplying milk under suspicious circumstances, and you would make him prove that it actually did come from the cow or cows?—If the farmer were in question, but the farmer would often not be in question.

3002. I mean going back to first principles?—Yes.

3003. But, as a practical man yourself, you would not be afraid of fixing that standard?—I should not be afraid of fixing a higher standard.

3004. You think that it would be a benefit to the farmer as well as the consumer?—I think so. It is the competition of inferior milk and mixed milk which has so diminished prices. In past years milk in July, August, and September has been from 1½*d.* to 2*d.* a gallon higher than it is at the present time: but year after year the milk supply is increasing, and with the increased supply we get an increase in the manipulation of milk, and hence the price is going down until we shall have it presently at half the price, unless something is done to diminish the manipulation.

3005. Did I rightly understand you to say that you would forbid the colouring of milk at all?—I would forbid artificial colouring.

3006. That is only done, I suppose, by the retail people?—Yes.

3007. And not by the farmer?—No, certainly not by the farmer.

3008. You mentioned something about cream; I understood you to say that there was not much adulteration of cream in London?—No; I gave an instance in which I saw cream being adulterated with milk.

3009. But the Chairman asked you whether it was adulterated with other substances, and I thought you said "No"?—I did not gather that.

Mr. *Jeffreys*—continued.

3010. Have you had any experience of that?—I have had no experience of cream being mixed with anything but milk.

3011. It is very often noticed, for instance, by the ordinary public, that cream in London after you have poured it out, leaves a kind of deposit in the jug, which shows almost that it must have been adulterated?—Would that be the preserved cream.

3012. No, the ordinary cream that you get from a dairyman. You have no experience of that?—I have none at all.

3013. In your former evidence you said that there was a necessity for greater inspection. Do you know what the inspection is in the county in which you live, Hampshire. How many samples of butter, for instance, were procured last year?—I could not tell that off hand. I have the report, but I could not give you the figure.

3014. Here is the return of the chief constable, from which I see that in that year only 25 samples were procured?—I can quite believe that.

3015. That is totally insufficient I imagine?—That is the case all over the country, except in certain districts where the authorities are very energetic.

3016. Therefore, any given return with 25 samples procured is absolutely worthless?—Yes.

3017. Then the number of samples of new milk procured were 99?—Yes.

3018. That is very few cases, is it not, considering that Hampshire is a dairy county to a great extent?—Yes.

3019. But out of those 99 samples procured, only 14 were proved to be adulterated. Would you think that taking those two instances there is great need for inspection?—I think so. Speaking of Hampshire in particular, I could put my hand upon one or two men that you could fine once a week under the present law.

3020. For adulterating milk?—Yes. For persistently adulterating milk. They do not mind the small fines at the present time at all.

3021. Are these men dairy men or farmers?—Dairy men, retailers.

3022. That is very important. These retailers that you know adulterate the milk, and yet are not prosecuted?—They are not prosecuted.

3023. Then, when you have this bureau of dairy produce at the Local Government Board as you suggest, all those instances would be referred to them?—I think they should. I should do as they do in Massachussetts, where they have a bureau. I can tell you the details with regard to the regulations of the Massachusetts Dairy Bureau. They not only control the quality of the produce, but they carry out the law with regard to everything connected with the dairying industry: "In the State of Massachusetts a law creating a dairy bureau went into effect on the 1st September 1891. According to the provisions of this law, the bureau in question is placed under the control and direction of the State Board of Agriculture, and its particular duties are defined as follows:—To investigate all dairy products and imitation dairy

Mr. *Jeffreys*—continued.

dairy products bought or sold within the Commonwealth. To enforce all laws for the manufacture, transfer or sale of all dairy products, and all imitation dairy products within the Commonwealth, with all powers needed for the same. To investigate all methods of butter and cheese making in cheese factories or creameries, and to disseminate such information as shall be of service in producing a more uniform dairy product of higher grade and better quality. The law gives the bureau authority to enforce all the laws relating to dairy products; but up to the present it has been only able to deal with the regulations respecting oleomargarine. These regulations are briefly as follows:—(1) Requirements for branding boxes and tubs, and for marking wrapping-paper, with a penalty for false marking or branding; (2) a prohibition of the use of the word 'dairy' or 'creamery' on any tub or package; (3) a requirement for licensing dealers and conveyors; (4) a penalty for selling oleomargarine as butter; (5) requirements for signs on stores and waggons; (6) a prohibition of its sale at hotels and restaurants without notice; (7) a prohibition of the sale of any imitation of yellow butter." It appears from the "Report of the Dairy Bureau of the Massachusetts Board of Agriculture for the year 1892" that, in enforcing these laws, the greatest number of actions that have been brought by the bureau have been against sellers of an imitation of yellow butter. All these actions have been stubbornly contested. Notwithstanding the opposition that has been encountered, the legislation under which the bureau has acted has apparently been of much value in preventing dishonest practices and in restricting the sale of oleomargarine, which compound has been characterised by the Supreme Court of Massachusetts as a deceptive substance, and one designedly made for the purpose of being passed off for something different from what it is. The bureau also pays great attention to the milk supply, and works in harmony with the boards of health and the milk inspectors in the various cities of the State. This plan has been found to work well, and the bureau now periodically sends out an expert, who attends agricultural societies, meetings, and institutes, and delivers addresses on questions relating to the milk supply and other dairy topics."

3024. With regard to these men that you suspect adulterate the milk, why do not you or some of the public take notice of it by advising the Chief Constable?—I have done something myself, but it is quite useless in many cases to make any suggestion at all; it is like making a suggestion in the past to the chief Government authorities when they have absolutely refused to prosecute.

3025. They take no notice of it?—They take no notice of it.

3026. But do you think that the general public often endeavours to promote prosecutions?—No, I do not think they do.

3027. You imagine that in a general way they take no notice of it?—Yes.

3028. They think that it ought to be left to paid officials?—Yes.

Mr. *Jeffreys*—continued.

3029. Therefore, that is one great reason why you would have this bureau for dairy produce established?—Yes.

3030. With regard to margarine I think you said that you would have colouring altogether forbidden?—Yes, except so far as the slight shade that is conveyed to the margarine by the milk with which it is mixed.

3031. And having forbidden the colouring, did you advocate that there should be specially shaped packages?—Yes.

3032. What would you think about making a certain colour obligatory on the packages?—That was the suggestion put to me before; I had not thought of it myself.

3033. Would not that be better than any special shape of the vessel, or any letters upon it?—It appears to be *prima facie* a very excellent idea; I had not thought of it before.

3034. Do you see much difficulty in the way of imposing such a requirement?—No, I do not see any greater difficulty in that than in imposing a package of a certain shape.

3035. I mean that if there was no more difficulty the colour would catch the eye of the man who went to purchase much more easily than the shape, would it not?—Yes.

3036. With regard to separated milk, I do not think that you have told us much about what we have been told by other witnesses, namely, that there is a good deal of adulteration by mixing separated milk and fresh milk together?—Yes; I gave some evidence last week upon that point.

3037. Many of the witnesses have told us that that is impossible to detect; is that your opinion?—I am afraid that it is, up to a certain point.

3038. The solids would be the same if you analysed them, would they?—No, on the contrary.

3039. Then by analysis you would detect that, would you not?—No, you cannot detect it, because the solids are not a sufficiently clear guide to enable the analyst to denounce the milk for the reason that the fat being above the limit that the analyst accepts, he would not be inclined to condemn it.

Mr. *Herbert Gardner.*

3040. Would there not be an abnormal increase in the non-fatty solids?—Yes.

3041. By that means could you not at least suspect adulteration?—Yes.

3042. But you could not prove it in a court of justice?—I am afraid not.

3043. But I understand that there is an enormous increase in the non-fatty solids when separated milk is mixed with ordinary milk?—Yes, but because the non-fatty solids are increased, I take it that it would scarcely be possible to convict.

3044. But then if that state of things does not occur, does it under any other circumstances, except when it is mixed with separated milk?—No, that is not so by any means.

3045. Then would not that be admitted as a means of proof?—It might be a proof; but so

Mr. *Herbert Gardner*—continued.

long as a man maintains the fatty solids he is within the law.

Mr. *Jeffreys.*

3046. But if you could not get sufficient evidence to convict, you would not think of prosecuting?—No. The point is that the retailer escapes prosecution and conviction, because he maintains the fatty solids.

3047. What other method could you adopt to prevent what is clearly adulteration if you get inferior milk. This separated milk and fresh milk mixed gives an inferior article to fresh milk?—That is a question which I should like to answer generally. Taking normal fresh milk as containing 3·4 per cent. of fat and 9 per cent. of solids not fat, I should say that if the mixed milk contained less fat and more solids not fat, the mixed milk would be inferior as a food.

Mr. *Herbert Gardner.*

3048. But if it contained the same amount of fat, would it be an inferior article?—Then it is quite equal.

Mr. *Jeffreys.*

3049. But could it maintain the same amount of solids. If you admit that separated milk and fresh milk mixed are as good as fresh milk, most people would mix them?—I do not say that. I put the specific case. Perhaps it would be best to go back to the very first principles. Separated milk contains but a mere trace of fat, perhaps ·15; and new milk, taking an average sample, contains 3·4 per cent. of fat. The analyst takes as the standard, as a rule, 3 per cent., 3·0 below which he will not prosecute. Therefore if, by the admixture of a separated milk containing ·15 per cent. of fat with normal milk containing 3·4 per cent., you can produce a mixture which shows the fat above 3·0 per cent., then the seller of that milk is not liable to punishment, although he is producing a food of inferior quality.

3050. And which you say is less nutritious?—Unquestionably; you decrease the fat, you decrease the feeding value of the milk.

3051. Then how are you to detect what I believe is a great method of adulteration; how are you to stop this adulteration?—So long as the fat in the mixed milk is above 2½ per cent. you cannot stop it. The only point which I suggest would be a way of stopping it, is to raise the standard of fat to 3·2 per cent.

Mr. *Herbert Gardner.*

3052. As long as the standard of fat is up to the average, milk mixed with separated milk is just as good as the other milk which has a similar standard of fat?—Yes.

3053. It is only when it falls below the standard of fat that it becomes an adulterated article?—Yes.

Sir *Mark Stewart.*

3054. It depends entirely upon how much separated milk you add to the fresh milk?—Yes.

Mr. *Jeffreys.*

3055. To follow that up, you said just now that separated milk was worth 1*d.* a gallon?—1*d.* to 1½*d.* a gallon.

3056. And we know that fresh milk is worth 6*d.* to 8*d.* a gallon; therefore how can the separated milk be anything like as good as fresh milk?—The difference in value is solely attributable to the loss of fat.

3057. Then I come back to the original proposition, and ask you whether this mixture of separated milk and fresh milk is not, in a general way, a much inferior article to fresh milk?—If the fatty properties of the mixture are below what they ought to be, then the feeding value is distinctly lower.

3058. Then one object of fixing a standard of milk would be to detect this form of adulteration?—It would be one means of preventing the trade from mixing it.

3059. You think that if the standard were fixed at anything like 12 per cent. of solids and 3·2 per cent. of fats, that would prevent a mixture of separated and fresh milk being sold as fresh milk?—Yes, it would.

Mr. *Herbert Gardner.*

3060. About butter; changes occur in butters when they have been kept any time?—Yes.

3061. Could you describe what these changes are?—In the first place it depends upon the manner in which the butter was manufactured, whether with pure water, and whether the curdy matter has been removed. The changes undoubtedly are the decomposition of the curdy matter which the butter contains, and, if the water contained any organic matter, the decomposition of that also. Then if sugar is left in the butter, there would be a change in consequence of the conversion of the sugar into an acid.

3062. Do those changes render it difficult to detect the presence of foreign fat?—I do not think so, so far as I know.

3063. In examining a sample of butter, for instance, would it be easy for you to determine what its age was?—Not in all cases.

3064. How near could you get?—That would depend upon the brand of butter and the manner in which it had been kept. For instance, if you take a sample of butter from Australia or New Zealand, kept in a cold chamber, it might be possible for an expert to be so deceived that he would describe it as being newer than butter made in England a fortnight before.

3065. You said, I think, that you thought that margarine ought not to be coloured at all?—I think it should not be.

3066. How would you propose to prevent margarine which is imported from abroad, where large quantities are made, from being coloured, because it might arrive here already coloured?—That is a point of very considerable importance.

3067. Have you any proposal to make on that subject?—I think I have already proposed that, in addition to the specific packages which should be provided, it should all be examined at the port of entry.

3068. And

Mr. *Herbert Gardner*—continued.

3068. And if it was coloured you would not let it into this country?—If it were coloured I would not admit it.

Mr. *Frye.*

3069. Would it not take a considerable time to examine it in that way?—No; in the Cork markets the inspectors daily examine a very large number of casks, and I do not suppose that the opening of the cask and the removal of the whole of the staves, and putting them together again, takes a minute.

3070. But there would be very much larger cargoes of foreign butter?—Yes; but I take it that the staff would be increased in proportion.

Mr. *Herbert Gardner.*

3071. I think you said, in telling us what the practice was in foreign countries, that in New York no foreign substance whatever was allowed in the milk?—In New York State.

3072. Any foreign substance whatever was considered to be adulteration?—In the milk any foreign substance whatever was considered to be adulteration.

3073. Is not milk sometimes coloured with anatto?—Yes.

3074. Are not also preservatives sometimes put into milk like boracic acid?—Very commonly, indeed.

3075. Would you recommend in this country that that law should be applied, that any foreign substance in milk should be considered as adulteration?—No, I would not.

3076. Because it would apply to preservatives, I suppose?—Yes; I think preservatives really do prove to the trade and the farming classes of very considerable value, without hurting the public at all. I do not think, so far as infants' foods are concerned, that it is very wise to give children preservatives.

3077. Therefore the law, as practised in New York State on that subject, has not got your approval?—Not upon that point.

3078. I want to ask you how much cream it takes to make a pound of butter?—That is impossible to answer.

3079. You are quite certain?—It is quite impossible.

3080. Has it never been tried?—Many times; but it is impossible to answer the question. I will give you my reason. There is no standard of quality of cream, and there is no possible means of devising a standard, because cream rises under all conditions upon milk, and you may take by the separators from 7 per cent. up to 50 per cent. if you choose, and call it cream. Similarly, if you allow milk to stand in the air for the cream to rise, it entirely depends upon the temperature whether cream is thick or thin, whether it is large or small in quantity.

3081. Have you given any evidence about adulteration of cream?—Only incidentally.

3082. Do you know whether cream is adulterated very much in the metropolis?—I said I did. I said I knew it was mixed with milk.

Mr. *Herbert Gardner*—continued.

3083. But you do not know of any other foreign substances being mixed with it?—Excepting preservatives.

3084. Have you ever analysed any cream?—No, I am not an analyst.

Sir *Mark Stewart.*

3085. With regard to the colouring of margarine, in Denmark the law is that it should not be coloured, is it not?—Yes.

3086. And I suppose there is no difficulty experienced there?—Not the least.

3087. We get a very large quantity of margarine from Denmark, do we not?—No, we get butter from Denmark; not any margarine.

3088. Holland is the chief country of margarine exportation?—Yes, Holland is the chief culprit.

3089. But it is in order to prevent fraud in butter, is it not, that the Margarine Act prevents margarine being coloured in Denmark?—Yes.

3090. If margarine was uncoloured, and if it was differently labelled, you think that that would be a sufficient preventative against its being sold in this country as butter?—I think, if it were uncoloured, and mixing prohibited, we should have nothing to complain of at all.

3091. Could the retail seller mix it without putting the margarine and butter through a certain class of machinery?—He could, but I do not think it would be likely that he would.

3092. Then in fact, margarine would take the place of being used only for cooking purposes?—Not at all; I think it would be largely consumed by the poorer classes, as it is now.

3093. Although it was perfectly white?—Although it was perfectly white. I think it would be used to a larger extent because of the reduction of price.

3094. You do not think that that would spoil the sale?—Not the least; I think the sale would be enhanced.

3095. I think you said that the consumption of margarine in this country was about 5lb. per head of the population?—No; I said that I believed, from the figures that I worked out, that the sale of Dutch margarine was equivalent to 5lb. per head of the people in this country.

3096. Dutch margarine alone?—Yes.

3097. And then there is a large exportation from other countries, from America, for example?—Yes, from several countries.

3098. So that it would come to a great deal more than 5lb. per head?—Unquestionably.

3099. Do you think that margarine lowers the price of home-made butter in this country?—I think that is one of the very things that it has done.

3100. Do you think that margarine and what they called filled cheese, that is, skim milk cheese, lowers the price of good cheese in this country?—I should not like to suggest that it has done so much, because the sale of filled cheese is not very much yet; it is a growing trade.

3101. Farmers object to it?—Yes; farmers object to it very much.

Sir *Mark Stewart*—continued.

3102. Do you think that they have good reason for objecting to it?—Yes, very good reason.

3103. Would you have any shape given to packages that contain margarine in order to secure facilities for passing it through the Customs?—I think there should be either a shape fixed somewhat similar to the shape of the Danish tubs or Swedish boxes (the Swedish are oblong and the Danish are oval) unless the colouring of the boxes, which has been suggested were adopted.

3104. Have they had much difficulty, so far as you know, in America with regard to the adulteration of butter and margarine?—Very considerable difficulty.

3105. Of both substances?—The adulteration of butter with margarine.

3106. I do not know whether you gave evidence in regard to the registration of milk sellers, and butter and margarine sellers?—With regard to margarine I did, but not with regard to milk.

3107. You think that they all ought to be registered?—I believe that at the present time the milk seller is supposed to be registered.

3108. I do not think he is?—And his premises are supposed to be examined, but they are not in many cases.

3109. You think that that would prevent adulteration?—I think it would not only prevent adulteration, but would prevent outbreaks of disease in many cases from the sale of milk kept in dirty premises and in dirty vessels.

3110. And you would advise that course to be adopted?—With great rigour on farms as well as retailers' shops.

3111. That, you propose, should be done at the instance of the Board of Agriculture?—I think that the Board of Agriculture would confer a great benefit upon the whole community by doing something of that kind.

8112. Have you been asked any questions about tuberculosis?—No; it was mentioned last week incidentally.

3113. Is it your opinion that tuberculosis does much harm to the milk-drinking populations?—I am afraid I am not in a position to answer that question, but that the disease has done much harm to farmers I am quite aware; I have suffered very seriously from that myself.

3114. I suppose that a great many instances have come under your cognisance of tuberculosis in cows?—Yes. I should like to make a remark upon the point to this effect, that a farmer has an outbreak of tuberculosis amongst his cattle, and he does not know what it is; a cow, perhaps, is taken ill; she gradually declines, and ultimately dies, or is slaughtered; then she is succeeded by others, and cow after cow is taken ill, and either sold or dies. But the farmer suffers the loss.

3115. They milk very heavily too, do they not?—Yes, sometimes.

3116. When they are almost at death's door?—Yes. The farmer is unwilling to slaughter the cow until the very last; he is unwilling to refrain from milking her, because he cannot afford it; and the consequence is that tuberculosis is distributed from farm to farm by the cows sold, and in all probability to people by the milk drunk.

Sir *Mark Stewart*—continued.

3117. It vitiates the milk that is sold to people?—I suppose so.

Mr. *Herbert Gardner.*

3118. There is a Royal Commission on Tuberculosis; have you given any evidence before them?—No; I have no evidence upon the point except as to the very serious losses entailed.

Sir *Mark Stewart.*

3119. Do you know the percentage of loss in an ordinary farm by cows afflicted with tuberculosis?—Very often it is 10 per cent., I know. Inspection by skilled inspectors would, to a great extent, prevent the retention of those cows, and the distribution of their milk.

3120. Can you detect the germs of tuberculosis in the milk?—I do not suppose that that is possible.

3121. Then the remedy would be to inspect the cows?—Yes; and you require very skilled inspectors, because, to my knowledge (I have evidence upon the point), I do not like to reflect upon any class of men, but local veterinary surgeons are not always competent. I have seen cases in which cows were passed as healthy, and subsequently they have died at a very early date from tuberculosis.

3122. That would entail a great many inspectors to go round the country, would it not?—Yes.

Mr. *Kilbride.*

3123. Is it the fact that there is a great difference in the percentage of tuberculosis in dairies, according to whether it is a country dairy or a dairy in a city?—Yes.

3124. What would be the difference in the percentage?—It is impossible to give the difference, because the data are so inadequate; but I should say, roughly, that the cases of tuberculosis in town dairies are twice as many as in the country.

3125. Is it not the fact that tuberculosis is is very rare in the country?—I do not think it is at all; I think it is very common.

3126. I mean in country dairies as distinct from town dairies?—Yes, as distinct from town dairies it is.

Sir *Mark Stewart.*

3127. Are there any special modes of testing milk which any ordinary farmer could adopt?—Yes, there are several modes.

3128. Which would be the mode that you would recommend?—I should recommend what is known as the Babcock test, or the Gerber test, which is very similar, or what is known as the Marchand test.

3129. These are all tests that a farmer could use himself?—Yes.

3130. Without any necessary skill?—Yes.

3131. Except

Sir *Mark Stewart*—continued.

3131. Except, of course, following the rules?—Yes; any member of a farmer's family could be shown how to do it in 24 hours, with perfect confidence.

3132. Which of those three do you think is the most suitable?—The simplest is the Babcock, and in the end it is the cheapest, because you can take so many samples at the same time; but the initial cost is a little more than that of the Marchand test, which is very cheap indeed, costing 12*s.*

3133. It is a simple way of arriving at a fair and reasonable conclusion, you think?—It is as good as chemical analysis, and, I should say, quite as perfect for all purposes as regards the fat.

3134. It would not give you all the solids?—No, that would not be necessary.

3135. Has it come within your knowledge that there have been any objections taken to the analytical chemists at Somerset House?—For many years past there has been great objection taken.

3136. What objections have been taken?—That they are too lenient, and that they pass materials sent to them for analysis at a higher standard than the analyst in the country.

3137. What do you mean by a higher standard?—Perhaps the word is improperly used. I mean that they would accept butter, for example, containing 18 or 19 per cent. of water, whereas the analyst might very probably have declined to pass more than 15 per cent.

3138. Would that be one of your main reasons for recommending legislation upon this subject, for having a fixed standard both for fatty matter and solids?—Yes; at the present time the law is most unsatisfactory upon that point. Analysts have their own fads, and people are frequently allowed to escape when they ought to be punished; and I have no reason to doubt that people are often punished when they ought to be allowed to escape.

3139. It would not necessarily entail more expense to have a more accurate mode of analysis, would it?—I do not see why it should.

3140. And to have a uniform system?—No.

3141. It would not entail more analysts, or more inspectors?—I do not think it should.

Mr. *Herbert Gardner.*

3142. If there was a uniform standard I suppose you would not object to the Somerset House analysis?—Yes, I would, because the work that Somerset House performs is too large in its scope. I think that dairying ought to have a special department and specially trained men, not men to day analysing vinegar, to-morrow something entirely different, and the next day milk; they should only do work as to milk products.

Sir *Mark Stewart.*

3143. Would it not give greater confidence to the public if it were to be exclusively under the Board of Agriculture?—I think that the Board of Agriculture would give every satisfaction.

Sir *Mark Stewart*—continued.

3144. That would satisfy the community in a greater degree than Somerset House?—I think so.

3145. Although they do work together I understand, I suppose that a good deal of difficulty arises on the different modes of analysing employed?—I do not know; I think chemists generally adopt one method now.

Mr. *Herbert Gardner.*

3146. With regard to separated milk, is it your opinion that separated milk should not be sold at all?—No.

3147. But that it should be sold absolutely as separated milk, and as nothing else?—Yes.

3148. Do you think that the demand would be sufficiently great to absorb the amount of separated milk that there is in the market?—It is not sufficiently great to absorb the balance that is not mixed with new milk at the present time.

3149. Many people suggest that it would be a good thing, and I think so myself, that in county districts there should be creameries as there are abroad for the manufacture of the butter in counties, so as to get butter of a uniform quality. There would be large quantities of separated milk at those creameries of course?—Yes.

3150–1. Would it not be a loss to the farming community if that milk could not be properly placed?—It is at the present time. There are now many factories and creameries in the country where butter is made, and the separated milk is either sent to the pigs or in some cases poured down the drains; it is by no means uncommon.

3152. Would not that be a loss to the farming community; would it not be an advantage to the farming community if that milk could be disposed of?—It would be a very great advantage.

3153. So that you would not altogether object to its sale?—No; but the great bar to the sale of this milk at its feeding value as distinct from its market value is the railway rates; they charge as much to take a gallon of separated milk, worth 1*d.* or 1½*d.* as they charge for the best milk in winter, which is worth 1*s.* a gallon.

3154. And with regard to mixing it with other milk upon which Mr. Jeffreys was asking you some questions, is it not the fact that the only possible standard that you can have before you is the standard of fats?—Yes.

3155. And if the milk is mixed with separated milk and yet represents the standard that you wish to see established, nobody could tell the difference?—No.

3156. And no harm would be done to the consumer?—No. If for example this proposal of mine were made law, and the seller was obliged to sell milk containing 3·2 per cent. of fat, it would still be open to him to buy milk containing 4 per cent. of butter fats and mix a skim milk with it; but that standard could not be kept any more than we can keep the present standard.

3157. If you established your standard and the milk was sold at a certain standard to the consumer, no harm would be done to the consumer or producer or anyone?—No.

Mr. *Herbert Gardner*—continued.

3158. And practically it would be a guarantee from the seller to the consumer of a certain percentage of fatty solids?—Yes.

3159. Would there be any harm done if the consumer wished to buy milk of a less standard; supposing that with his eyes open he said to the distributor, "I wish to buy cheap milk with a less percentage of fat in it than the standard," is that any harm to the consumer?—No.

3160. Or to the trade?—No.

3161. Or to the farmer?—No.

Mr. *Frye.*

3162. Is not this separated milk manufactured in many parts into condensed milk?—Yes.

3163. And are there any such factories in England?—I do not know any factories for condensed skim milk.

3164. There are some in Ireland, I think?—There are some in Ireland.

3165. There is one at Limerick, I think?—Yes.

Mr. *Jeffreys.*

3166. With regard to that separated milk, I hope it will not go forth from you to the public that you advocate the mixing of separated milk and fresh milk?—On the contrary, I have given evidence opposing that as far as possible.

3167. Therefore, when Mr. Gardner said that there would be no harm in buying an inferior article, there is no harm in buying milk mixed with water, is there?—Not if the public like to ask for it.

3168. But they ought to know what they are getting?—Yes.

3169. And in separated milk the first idea of the name means that the fatty solids are taken out for the purpose of making butter?—Yes.

3170. Therefore, separated milk in a general way is an inferior article?—Yes.

3171. You could not detect it, probably, unless the solids were below a certain standard; but if you could detect it you would wish to prevent its sale?—I wish to prevent it entirely, but I could not advocate a law to prohibit a man saying to a producer: "I want to buy from you separated milk or milk partly deprived of its cream."

3172. Would it not be well to make a law that separated milk must be sold separately, in the same way as in Denmark and other places, margarine has to be sold separately and not mixed?—Yes.

3173. Would you not advocate that separated milk should be sold apart and distinct from other milk?—I do not advocate it, because I assume it would be, in case the law was passed. I assume that, in case a law establishing 3·2 as the standard were passed, then all milk below that standard would be sold as separated milk.

Colonel *Warde.*

3174. Would it be possible to mix any appreciable quantity of separated milk with fresh milk without reducing the percentage of solids below the standard?—Yes, it would be possible.

Colonel *Bagot.*

3175. With richer milk?—Yes; but, of course, the facilities would be much smaller on account of the greater value of the milk which would have to be bought for the purpose and its greater rarity.

Colonel *Warde.*

3176. You think that using separated milk with fresh milk would absorb a considerable quantity of separated milk that is now on the farmers' hands?—It would not absorb so much as it does now by a long way, because, in consequence of the existing limit being very low, it is possible to mix upon a very large scale without detection; but, if you raise the limit to a standard such as I suggest, it would be impossible for the trade to be so large in mixed milk, because of the greater rarity of milk of a high standard and its greater cost.

Colonel *Bagot.*

3177. Is boiled milk discoverable by analysis easily?—I think in many cases it could be discovered because of the coagulation or partial coagulation of the albumen; that would be rather a physical examination.

3178. Have you observed any amount of milk which has been boiled in small shops?—I know of none.

3179. Not mixed with fresh milk?—No.

3180. Do you think that is a likely thing to happen in small places where people, not having sold out their stock, endeavour to keep it by boiling?—No; I think they would rather add an antiseptic than boil it, because you can detect the boiling by the flavour.

Mr. *Channing.*

3181. A question was put to you by Mr. Jeffreys as to this introduction of separated milk in connection with high-class milk from Jersey cows, and so on. As regards that, the cost is a sensible item, is it not?—Yes.

3182. It would be rather too costly a fraud to be had recourse to by most traders, if a standard as high as you name were adopted, would it not?—It would be morally impossible for many traders to do it at all, in consequence of the extra cost of the milk.

3183. Are you aware that that opinion has been given expression to in America with regard to that very suggestion, that the cost practically excludes that kind of fraud if you have a sufficiently high standard?—Yes.

3184. Have you any evidence to give us, as to analyses of milk of your own cows that you have taken at different seasons, morning and evening?—I thought I had a few with me, but I am afraid I have not; but I can give you the gist of the figures.

3185. As taken at what season?—Taken in almost every month throughout the year 1891-2; and in but one case did the fat fall below 3·32.

3186. Is that with regard to the morning's or evening's milk?—That was the morning's milk.

3187. And have you got figures as to the evening milk?—I have not got figures as to that.

Mr. *Channing*—continued.

3188. You are sure that you are not reversing the figures, giving morning for evening?—Quite.

3189. The minimum percentage was about 3·11?—Yes; that was in the month of May.

3190. In what months did you find the largest amount?—In January.

3191. Have you any evidence to give as to the food that you found produced the maximum of fat?—No, I have not found any real difference at all, any sensible difference, whatever the food has been. We have repeatedly taken analyses by the Marchand system to show the fat percentage; and whether the feed has been cotton cake or dried grains or bean meal or any of the various foods used upon a farm, I have not perceived any sensible difference.

3192. In the proportion of feed present?—Excepting in the season of the year; and that I attribute principally to the fact that when the cows are in the flush of spring grass they give much more milk of a lower quality; and that in the autumn when they are in the aftermath and getting half the quantity of cake, they then give milk of a much higher quality indeed, but the quantity is diminished very considerably.

Mr. *Kilbride.*

3193. Is it the season of the year, or is it the length of time that the cow has calved?—It is the length of time that the cow has calved. As she diminishes in her yield she increases in her quality.

3194. But that depends upon the length of time that the cow has calved, and not so much upon the particular season of the year?—It does.

Sir *Mark Stewart.*

3195. The season of the year has something to do with it, has it not?—I should not like to say so.

Mr. *Channing.*

3196. But you have no doubt that the proportion of fat in milk is very much greater in the autumn?—No.

3197. Returning for a moment to the first question that I put to you, do I correctly understand that you actually recommend that all milk below the standard should be described as separated milk, whether it is or not?—No, I made no recommendation; I said I assumed it would be. I do not make any recommendation upon the point at all.

3198. Would it not be sufficient to treat the question of the introduction of separated milk as an adulteration, and to sell it as whole milk is a misrepresentation, and at the same time to adopt a standard of the minimum of fat in pure milk. Could the two be combined; would it not be possible to have a minimum of fat standard of milk, and also to rely upon the ordinary law with regard to misrepresentation in the case of separated milk?—I do not quite gather the gist of the question.

3199. I see great difficulties in treating all milk below a certain fat standard as separated

Mr. *Channing*—continued.

milk, and I was asking you whether, even if you adopt a fat standard, you could not also treat the introduction of separated milk, whatever the standard was, as a misrepresentation?—I see what you mean; it might not be separated of course; it might be 3·1 and still be pure milk, and if that were described as separated milk it would be a misrepresentation.

3200. Could you not punish as fraud the introduction of separated milk, whatever the proportions found in the milk were, as well as have a standard of fat?—Yes, certainly, if it could be detected.

3201. If you could rely upon somebody detecting it?—Yes.

3202. I do not know whether you have given evidence on the point that you have in your table of evidence as to margarine cheese?—Very little.

3203. What evidence have you to give as to the desirability of branding cheese made with margarine; have you given any evidence on that point?—I have only mentioned that as margarine cheese is being made to a very large extent, and, I have no evidence to prove it, as it is probably sold in some cases as butter is known to be sold for what it is not, I think that margarine cheese should be branded with an impressed brand, as is the case in Denmark and elsewhere.

3204. Do you think that it would be desirable for the English cheeses which are made of full milk to be branded also?—I do not suggest that there should be a law upon the point, but that the farmers would benefit themselves by branding their cheeses.

Mr. *Frye.*

3205. But you would make it the law as regards margarine cheeses?—Yes.

3206. But not as regards English cheeses?—No, that might be optional.

Mr. *Channing.*

3207. You think it would be to the benefit of the farmer to do so?—Yes.

3208. And if it were done, he would be liable to the general law if it were misrepresented?—Yes.

3209. Have you given any evidence as to the practice in the State of New York and Canada?—Yes.

3210. Have you given evidence as to the desirability of applying all legislation applicable to margarine also to margarine cheese?—Yes.

3211. Have you any evidence to give as to cheese made from skimmed milk?—No, excepting as regards the addition of oleo to the skimmed milk.

3212. You think it is desirable, I suppose from your evidence, that such cheese should be described; its source should be described?—As skimmed milk cheese, do you mean?

3213. Yes?—I do not think it is very essential, because it is so easily detected by experts.

Mr. *Frye.*

3214. But the public could not detect it, could they?—I think they would have a very shrewd suspicion of skimmed milk cheese.

Mr. *Channing.*

3215. Could they tell from the exterior?—No, they could not from the exterior, but they certainly would when they tasted it.

3216. And they would not go there again. Now about the Margarine Act: you are aware that the 9th and 10th Sections give no power to inspect the factories of margarine?—Yes.

3217. And it is one of your recommendations that there should be full power of entry and taking samples and of carrying out any other form of inspection which is deemed necessary in the case of margarine factories?—Yes, it is.

Sir *Mark Stewart.*

3218. One question arising out of Mr. Channing's examination: do you say that you find no difference in the quality of milk of cows owing to the feeding that they receive?—No material difference.

3219. If a cow is fed on bean meal heavily does it not produce a richer quality of milk?—I would not say that it does. In my experience I have found no essential difference whatever the feed has been, except with regard to the yield. I believe bean meal is an excellent food to increase the yield.

3220. And cotton cake is generally supposed by farmers, is it not, to increase the richness of the milk?—It is supposed to, but there is no real evidence upon that point.

Colonel *Warde.*

3221. I think you said just now that the registration of retailers of milk and the inspection of their premises is very ineffectually carried out at present?—Yes.

3222. Can you give us any reason for that?—No, excepting a lack of energy on the part of the local authorities, a lack of sympathy on the part of those who are supposed to inspect with the work they are required to perform; a general laxity all round. It appears to be nobody's business, or rather everbody's business, and therefore nobody's business.

3223. Can you suggest any remedy in the way of any alteration in the law, or anything to make it more compulsory?—Only that the whole of the work of dairy inspection should be placed under one bureau or department, and that the officers should be appointed and should be compulsorily required to carry out the work.

Mr. *Colman.*

3224. You said in one of your answers on Friday last that you believed that Dr. Bell and his staff had been very commonly responsible for permitting fraud to be continued, by the mild way in which their analyses are made?—Yes.

3225. And you say the same as to milk?—Yes.

3226. You think they have been much too lenient upon milk?—Much too lenient.

3227. You were asked a question just now as to the price of fresh milk; I understand that it was put at from 6*d.* to 8*d.* a gallon. Would you say that that is the price that the farmers can get on an average the year through

Mr. *Colman*—continued.

at their own farms?—I think they get more than that on their own farms.

3228. Sixpence to 8*d.* at the farmyard?—6*d.* to 8*d.* at the farmyard.

3229. The question was put in reference to separated milk at 1*d.* and 1½*d.*; and the circumstances would be precisely the same at the farmyard, would they not?—Yes.

3230. Do you think that 6*d.* to 8*d.* would be a fair price as compared with the 1*d.* and 1½*d.* at the farmyard?—No, I rather suggest 7½*d.* to 8*d.*

3231. At the farmyard?—At the farmyard.

3232. Do you consider the separation of milk advantageous to the farmers; I mean the new modern method of separating their cream; is that an advantage to the farmer?—In many cases it is, but I think in some cases it is not; it depends upon the class of work that he performs, whether he sells his milk, in which case it is not advantageous; or whether he makes butter, in which case it is advantageous; or whether he makes cheese.

3233. I presume that the separator has sprung up and got into use to a great extent because they get more butter or cheese from the cows in that way than they did in the old way?—They get more butter, certainly, but I would not like to say that the butter is of a higher quality.

3234. As to the question of the price of butter, have you any information at all as to what Australian butter is coming in at, and how far that is affecting the price of English butter?—I cannot give you data at the present time (this is out of the season), but last year Australian butter was being retailed at from 11*d.* to 14*d.* a lb. I am bound to say, to be fair to that class of butter, that in some cases the consumers would not have been able to obtain good butter at all but for the Australian butter.

3235. Have you any idea how those prices remunerated the Australian producers?—I receive their papers, and occasionally reports; I myself reported for the Government of New Zealand on the industries of the colony; and they say just as much as we do, that they are dissatisfied with the prices which they obtain.

Sir *Mark Stewart.*

3236. What are the expenses off the 11*d.* a lb. for freight and so on?—I think the freight costs about 1*d.*; I would not like to speak with certainty.

3237. And 1*d.* here for selling, or 1½*d.*?—I think the 1*d.* would include the whole; *i.e.*, exclusive of the retailers' profit.

Mr. *Colman.*

3238. You said that in America they had stamped out the sale of margarine?—In New York State.

3239. Not in America?—No; not in America.

3240. Then in other parts of America there is a considerable quantity of margarine or other butter substitutes sold?—There is; there is a different law in every State of the Union, and it depends very much upon the nature of the law whether

Mr. *Colman*—continued.

whether the sale of margarine or its manufacture is large or small.

3241. You gave us the cost of butter in New York: do you know anything about the cost of it at other places in the States?—No; I could not give you any figures with regard to any other place.

3242. Would it be anything like this: Boston 1*s.* 10*d.* and Philadelphia 1*s.* 11*d.*?—I should say not; I should say that those are rare prices. I know what is realised by some of the best makers; take for example, vice-president Morton, who has a leviathan farm on the Hudson River; he obtains about 1*s.* 6*d.* a lb. in the summer season for butter made upon the English principle.

Mr. *Frye.*

3243. The wholesale price?—Yes, the wholesale price supplied to hotels.

Mr. *Colman.*

3244. Then there is another question as to the price in New York; would not that be affected by the duty they charge upon butter coming in?—I do not think it would be. The producing powers of the American farmers are so great, and the dairy industry is so enormous in its character, that they can do almost what they choose.

3245. I presume that the object of that duty would be, if I may put it so, to increase the price of the butter?—Yes.

3246. The duty formerly was 2*d.*, and I believe now is 3*d.* a lb.?—Yes.

3247. Do you think that it would be desirable to drive out margarine from this country, and so increase the price of butter?—I do not suggest that we should drive it out; I simply suggest that we should stamp out the sale of margarine as butter. I am quite willing to admit my belief that it is a good food for the people, and a desirable food sold at its real value.

Mr. *Frye.*

3248. I suppose that many poor people would have no butter at all unless they could get margarine?—That is so; and many would have twice as much if it was sold at its proper price.

Mr. *Colman.*

3249. Have you examined samples or had specimens of the label that you referred to as to the inch and inch and a-half letters. Here are some that have been handed to me; it strikes me that they are rather large for small quantities of butter (*handing some labels to the Witness*)?—No, I think that would be a very fair size.

3250. For small parcels?—Yes, for small parcels. I would put the letters much closer together.

3251. What fine does the Margarine Act give now for third offences?—£100.

3252. How would the exhibition of the invoice, which was a warranty, exonerate the man who might be guilty. Must a man pleading for

Mr. *Colman*—continued.

defence of a warranty prove to the Court that he sold the article in the same state that he received it?—Yes.

3253. Is there not a fallacy in receiving a warranty and then giving a verbal statement?—I think so; I pointed that out last week. I think it is useless to admit it unless you can prove that the butter was sold exactly as it was received from the shipper or merchant.

3254. And might there not frequently be some misunderstanding as to the statement on the subject?—Yes.

3255. You said that the identity of the goods could not be proved; are you aware it has been proved to the satisfaction of the Court. Are you aware also that it is frequently proved when the retailer is summoned before Courts of First Instance. I am told there are cases of that sort?—I have not come across any single case.

3256. Do you happen to know what is the price of the largest proportion of margarine imported?—I do not.

3257. Would it be about 6*d.* a lb.?—Considerably less than that. I have seen it ticketed by the retailers at 4½*d.*

3258. You referred to the question of factories; are not factories where fat-melting is carried on now under the inspection of the Public Health Act?—I cannot answer the question.

3259. When you say that you advocate the inspection of factories, do you mean factories where the process is carried on, where it is being prepared; or where the article is being produced ready for the market?—Where the oleo is being produced, and where the margarine is being produced.

3260. The factory itself?—Both factories.

3261. Not merely the warehouse in which it is ready for sale?—Not merely the warehouse, certainly.

3262. You referred in one of your answers to the co-operative society and other sellers; do they continue still to sell margarine?—I believe so.

3263. You referred to a wholesale merchant; was he a butter dealer or a butter and margarine dealer?—I have referred to several; I do not quite understand which it may be.

3264. At Question 1938 you said "One wholesale merchant writes me to this effect: that a customer of his was getting 25 casks of mixture a week"?—Yes; he sells both butter and margarine.

3265. Did you suggest that Irish butter is ever mixed with margarine?—I did.

3266. In some instances?—I suggested, at least I referred to the fact, that the South of Ireland Association had complained to the Corporation of Limerick with regard to that admixture.

3267. You referred also to the price of 2*s.* 7*d.* and 2*s.* 9*d.* for butter sold in some parts of Paris, That would, I suppose, include their Parisian octroi duties?—That would be the price realised in the market.

Mr. *Colman*—continued.

3268. After they had paid the octroi duty?—The duty would be taken from that.

3269. Have you any idea what that would be?—I have not.

3270. You suggested, I think, that because those prices were made in Paris and lower prices were made in England the butter that comes here must be adulterated; is not that a little bit of a fallacy, taking the highest price that it makes in Paris and the lowest price here?—No; I referred in particular to the higher classes of butter that come from France to this country. I think I gave the price in London as from 1*s.* 4*d.* to 1*s.* 6*d.* a lb.?—I know of no butter coming from France of high qualities higher than that.

3271. But the butter sold in Paris would be sold subject to various expenses, which it would not be if sold from the farmer who makes the butter?—That would be a bagatelle in comparison with the price of the butter.

3272. There is the carriage of it surely from his own place to Paris?—Yes.

3273. And all those duties that it has to pay; therefore you must take something substantial off the price that he gets; do you know what that would be?—No, I do not. Coming to England, of course, there would be the shipper's commission and the cost of carriage to this country as well to be deducted.

3274. Do you think still that there is a large quantity of butter sold mixed with margarine, and that the sellers do not get any punishment for it?—I am quite convinced that it is so.

3275. Are you aware that the Grocers' Associations have taken this matter up and promoted some prosecutions?—Yes, I am aware that the Grocers' Associations also are very closely in unison with us as regards the propositions that we made, with the exception of colouring, and, perhaps, one other point.

3276. Then you do not imply that they are lax in the matter?—Not at all; on the contrary, I think they are very fair. There is one point, would you allow me to refer to, in regard to the French exports? In my evidence, as printed, there is a slight mistake, that I should like to take the opportunity of correcting.

Mr. *Channing.*

3277. At what number?—It is at Question 1950. I said that I took a party of English people over one of the factories. I said, "We were under the impression at the time from what we were shown, although we were not allowed to touch it, that it was all pure butter; but since then I have been informed." Then it says, "by the scientific advisers of the firm that they also blend." I have suggested the alteration, "informed by a scientific adviser of such firms." As a matter of fact, this would be very unfair to this gentleman, because he is a scientific adviser to one of the French margarine manufacturers, and I had the evidence from himself.

Mr. *Colman.*

3278. Then if they blend, as you say in this answer, very skilfully, it may be very difficult for the retailers to detect anything that comes over?—Undoubtedly; it would be impossible, I should say.

Mr. *Colman*—continued.

3279. Now, touching the question of licenses for the sale of margarine, do you suggest that any fee should be paid for the holding of the license?—No.

3280. Simply that they should not be allowed to sell it unless they have a license?—License or registration would be quite the same to me. I think that as the milk sellers are required to be registered, although the law is not carried out, so the margarine manufacturers and dealers and retailers should be required to hold a license of authority or to register themselves.

3281. Whether they are shopkeepers or what ever they are?—Yes.

3282. That would not be very easy, would it, to carry out, for milk, in country districts?—It is supposed to be carried out at the present time, although it is not. Nothing could be simpler; everyone is known who sells milk or produces milk.

3283. You said something about a block of marble, I think, on the question of its being in some shops; do you imply that that is used and put up for the purpose of concealing fraud?—Not put up for the purpose; I remember it before margarine was introduced, long before it was introduced; but I do suggest that in some cases it is used as a screen, behind which the unscrupulous salesman can mix and does mix the two articles together.

3284. Is pale butter popular in Lancashire?—I have some experience of Lancashire, but I have no particular experience with regard to colour. I have observed that the colour of butter there is like it is elsewhere.

3285. Is it very different from what it is in London?—No.

Mr. *Frye.*

3286. Did I rightly understand you to say that you are in favour of margarine not being coloured?—Yes.

3287. And butter at the present time is also coloured, is it not, to some extent?—I should say very little indeed.

3288. Would you prevent the artificial colouring of butter?—I should not object to do so at all, but I think it would be unnecessary. I think that so little colour is put into butter that it is practically *nil.*

3289. Then, if margarine were sold uncoloured, I suppose you would remove all the present restrictions that there are at the present time upon selling it?—Which restrictions do you refer to?

3290. The letters put in the packages, and so on?—No, I would keep the whole of them.

3291. But what would be the object; everybody would know it, would they not, by the colour?—But there would still be possible mixtures, so long as it is impossible to prevent the two things being mixed together.

3292. You have spoken of margarine cheese; is it easy to detect it from ordinary cheese?—I should say not at all easy.

3293. I suppose you would be able to detect it?—Not in all cases. I would not like to say that I should. I have detected it.

Mr. *Frye*—continued.

3294. The public would not be able to detect it, you think?—It is in a very incipient stage at present, and it is quite possible that the public may in many cases detect it. But when it is skilfully performed, as in the case of margarine itself, it would be impossible.

3295. Do you know the price that it is sold at?—I could not give you any quotation.

3296. Something has been said about skim milk cheese; do you approve of that?—Of its being made?

3297. Yes?—Yes.

3298. Would you brand it as such?—It brands itself really; it is quite unnecessary to brand it.

3299. There is a great quantity of cream sold now in small pots; is that preserved?—I believe it is all preserved.

3300. How is it preserved?—I am afraid that is a trade secret; but there are several materials: glacialine, boracic acid, and a material known as formalin. These are all used for preserving cream.

3301. You know, of course, that margarine factories in this country have to be registered now by the local authority?—Yes.

3302. In your evidence the other day you said that the importation of margarine had increased; have you any figures to show that?—I quoted the figures then; I do not know whether I have them with me again; I think they are in my evidence.

3303. I will give you them. Are you aware that the imports of margarine in the year 1888 were of the value of 3,000,000*l.*, and that in 1893 they were practically the same?—I could not answer the question without having the Returns before me.

3304. That the imports of butter had increased from 8,000,000*l.* to 12,000,000*l.*?—Yes, that I can quite understand. The perfection of the system of blending the two articles would account for the difference. We may go on having a reduction in the importation of margarine under the present law until we have very little margarine at all.

3305. These figures are quite the reverse of what you stated the other day?—I think my figures were with regard to Holland alone.

3306. Do you know whether many prosecutions have taken place during the last three years on samples of mixtures imported into this country?—A great many.

3307. I am told that there has been only one in the last three years?—But they appear in the trade papers every month.

3308. You said that for the third offence of selling margarine as butter a man should be imprisoned?—After the third offence, I said.

3309. Would not that be very severe?—The term of imprisonment which I suggest is infinitely less than it is in other countries. Under the new French proposal it is up to two years.

3310. Would not that prevent a great many honest dealers going into the trade?—I take my hint from one of the largest men in the trade, Mr. Lovell, who, I believe, himself, suggested before the Margarine Committee that imprisonment would be calculated to deter men from committing a fraudulent action.

3311. Have you ever heard of a shopman who

Mr. *Frye*—continued.

was under dismissal selling margarine as butter in order to spite his master?—I know of many cases. I have heard from London traders themselves that they have been subjected to great loss and annoyance and trouble through the misdeeds of shopmen. I think that is provided for with regard to the sale of milk.

3312. Then you said that great quantities of margarine were imported into Ireland; are you aware that there is a very large factory at Limerick?—I do not think I said so, but I believe it is so nevertheless. There is a factory at Limerick, I know.

3313. Then, about the price of French butter; are you aware of the price to-day of the two best brands of French butter imported into this country?—I cannot give you this day's price.

3314. Would it be about 1*s.* 1½*d.* a lb.?—I suppose it is.

Mr. *Kilbride.*

3315. I think you stated in reply to the Chairman that in your experience food had no effect on the quality of milk that the cow produces?—No material effect.

3316. Might I ask you, have you analysed many samples of milk where the cows were mainly fed on grains?—No, I do not analyse myself; I am not an analyst.

3317. Could you give us any evidence at all upon that point?—I believe that grains increase the flow of milk, and that to a small extent it diminishes the solids.

3318. Only to a certain extent?—Only to a certain extent. I do not think that grains have an influence in diminishing the quality of milk to so large an extent as is generally supposed.

3319. You are aware that it is usually supposed that grains have that effect?—Yes.

3320. You were asked something about tuberculosis, and you said that practically it was confined to city dairies, and that the country dairies were almost free from lung disease, I think?—Comparatively free.

3321. Is it not the fact that the appearance of lung disease in city dairies is largely due to the fact that cows are fed with stimulating food, and that they have not sufficient space?—As regards the food I should not like to commit myself; but I do believe that it is largely owing to the fact that they are confined in a limited space with an insufficient quantity of pure air and want of exercise.

3322. You would not say that stimulating food such as grains given hot to the animals has any appreciable effect upon the perpetuation of the disease in city dairies?—I think that in the nature of things the physique of an animal must suffer, and consequently the constitution, with high feeding and absence of exercise.

3323. You would be in favour, then, of giving all local authorities, I presume, compulsory powers to remove dairies altogether from the inside of cities?—I think I should. I do not at all approve of city dairies where cows are kept.

3324. In reply to Mr. Colman you stated that the New York State authorities had stamped out the sale of margarine?—Yes.

3325. By what process?—By exercising and carrying out the law with the utmost rigour.

Mr. *Kilbride*—continued.

The law preventing the manufacture and sale of margarine in the State.

3326. In New York State, then, the law absolutely prohibits the sale?—The manufacture and sale.

3327. Are you opposed to the sale of margarine if it is sold in this country as such?—Not at all.

3328. You are only opposed to the sale of margarine because it is sometimes sold here as butter?—If it were only sometimes I would not take the trouble to get up evidence against it, but I believe it to be consistently sold as butter through the medium of mixture.

3329. Then, do I rightly understand that what you have principally objected to is what is called high-class mixture, which only contains about 20 or 30 per cent. of margarine?—I object to all mixtures, unless they are sold as mixtures.

3330. And you object to the colouring of margarine?—I do.

3331. Do you object to the colouring of butter?—Upon broad principles I do, because I think it is a most unnecessary and careless proceeding; careless because there is no need to do it all if the proper cows are kept.

3332. The colouring of butter, in your opinion, does not lead to fraud. I put it to you in this way: that the consumer, when he goes into a shop to buy butter, whether it is coloured or not, is under no deception, and there is no fraud committed upon him; it is butter that is being sold all the same?—I refer to a case in which butter is of the abnormally pale type which is very seldom seen.

3333. Except in winter?—And very seldom seen in winter. I think if a consumer were asked whether he would pay a penny for coloured butter or this abnormally pale butter, he would pay the penny for the coloured. I think he would show a preference for the coloured butter; therefore, if he pays the penny for it because it is coloured, I should say that he was defrauded, inasmuch as he might be buying margarine as butter.

3334. But am I right in supposing that your great objection to colouring margarine is that it defrauds the consumer; that the colouring of the mixture gives facilities to the trader by which he imposes the article upon the consumer for something which it is not?—Certainly.

3335. And it is because you are opposed to fraud that you are so strongly opposed to the colouring of margarine?—Yes.

3336. And you would be in favour of some legislation which would absolutely prohibit the colouring of margarine or the mixing of margarine with butter?—I would.

3337. I think you stated, if you will look at Question 1939, in answer to Mr. Whiteley, that "A short time ago a deputation from the South of Ireland Butter Merchants' Association attended the meeting of the Limerick Corporation to call attention to the increased growth of butter adulteration or mixture in that city, when it was shown that tons upon tons of margarine were imported into Limerick." I think, in reply to Mr. Frye just now, you corrected that and

Mr. *Kilbride*—continued.

said that the margarine was not imported into Ireland?—No.

3338. Were you aware that there was a margarine factory in Limerick?—I was. So far as I remember I made no such statement as that.

3339. You did not state that margarine was imported into Limerick?—I merely quoted what had occurred between the South of Ireland Butter Merchants' Association and the Limerick Corporation.

3340. You are aware, as it appears there, that the South of Ireland Butter Merchants' Association are in favour of having the pure Irish butters sold, and nothing else?—I know they are.

3341. And they took this action in order to put down the mixture of Irish butter with margarine, to be sold in Irish towns as Irish butter?—Unquestionably.

3342. Do you think, then, that the South of Ireland Butter Merchants' Association are deserving of every support?—Unquestionably.

3343. In their desire to put down fraud?—Yes.

3344. And to put down adulteration?—Certainly.

3345. It was stated here that Irish butter, when it came to England, was sometimes mixed with margarine; is that so to your knowledge?—I have no knowledge at all of it.

3346. Are you aware of the fact that neither the South of Ireland Butter Merchants' Association in Limerick city, nor the Cork butter people, will permit, so far as they can prevent it, any Irish butter leaving Ireland except as pure butter?—I know that so far as the Cork markets are concerned they would not allow it; and I believe that, so far as the South of Ireland Butter Merchants' Association are concerned, they would not allow it.

3347. I see at Question 1942 you state that "Normandy and Brittany butters were sent to England with 15 to 35 per cent. of margarine mixed with them"?—Yes.

3348. What percentage of mixture is it possible for an analyst to detect; I will put it in this way: is it not the fact that it is almost impossible for the most experienced analyst to detect a mixture of margarine and butter, unless there is more than 20 per cent. of margarine?—I believe that to be the case, although I have letters, one or two with me, in fact, in which analysts differ upon the point. Some go as low as 10 per cent., or even less.

3349. You stated in reply to a further question that in the case of a manufacturer in France of a mixture of margarine and butter, although he was fined twice and sent to gaol, apparently it did not prevent his continuance of this fraud?—I do not think I said quite to that effect.

3350. No, you did not say it exactly the way that I put it, but it practically, I think, means that?—I think I left off at his being sent to gaol. I do not know what he has done since then.

3351. Would not that be evidence that, if it is desired to put down fraud, very stringent legislation is necessary?—I think it is.

3352. I think you stated that margarine was sold

Mr. *Kilbride*—continued.

sold here in the London market at 4½*d.* a lb. retail?—I said I had seen it.

3353. When; have you seen it, lately?—No, I suppose about nine months ago.

3354. What was the price of butter then?—It varies very much in England.

3355. Could you tell the Committee at the time when you saw margarine labelled at 4½*d.* a lb. retail in shops, what price butter was labelled at at the time?—The butter was labelled in the same town at 16*d.* to 18*d.*, and where I live at 14*d.*

3356. That is a difference of, nearly, from 9*d.* to 10*d.* a lb.?—Yes.

3357. And, to the extent of from 9*d.* to 10*d.* per lb., the retailers of margarine who retail it as butter are defrauding the public?—No, I would not go quite so far as that, because it is essential in order to obtain a high price for margarine to mix with it a larger proportion of butter, which would increase the cost price of the margarine; but even then the difference between the actual cost of the mixture and the value of pure butter is considerable.

Mr. *Dunbar Barton.*

3358. At Question 2144 you referred to the subject of water in Irish butter, and I think you mentioned, as two of the causes of the high percentage, their inferior utensils and the absence of spring water?—Yes.

3359. Are you aware also that as compared, for instance, with the Danish trade, the presence of ice in Denmark, and the absence or difficulty of obtaining ice in Ireland, is also a matter in which the Irish farmers are at a disadvantage?—I would say that the absence of spring water would include that. If you have a cold spring water you do not require ice.

3360. Are you aware that the Danish Government spend large sums annually on the special cultivation and encouragement of their butter industry?—Yes.

3361. And therefore to that extent also in Ireland they are at a disadvantage; money is found in Ireland very generously in many matters, but not with regard to the butter industry?—With regard to that point I am bound to say that the Irish have had advantages which we have not as regards butter-making. They have had excellent schools, which we have not had in England until very lately.

3362. That is to say, schools provided from public funds?—Yes. But with regard to the farmers themselves I am bound to say that in the big valleys in County Kerry, in which I have been, I cannot see how it is possible for the little farmers to produce a high-class butter, or a high-class anything, in the little cabins that they have, which are not fit for such a material as milk.

3363. That refers to the valleys in Kerry?—I take Kerry because I have been there to see what is being done.

3364. But I think you said in your evidence that you have no fault to find with the instruction in Ireland?—I have not.

3365. So that it is the inferior utensils and the absence of spring water?—Yes.

Mr. *Dunbar Barton*—continued.

3366. Those are the things, then, that we have to look to in Ireland if we want to improve our butter?—That is one point.

3367. Then you go on to say that you are in favour of fixing a standard, and you mention 16 per cent. of water?—Yes.

3368. Are you aware that Mr. Morley, the Chief Secretary for Ireland, wrote recently to Somerset House asking them to assist him with respect to fixing a standard upon this subject?—No.

3369. And they replied that they did not think it would be expedient to fix any such standard?—I did not know that.

3370. Are you aware that in Ireland the Government have taken steps to use the Royal Irish Constabulary as inspectors in country districts, in order to try to meet this question of water in Irish butter?—I was not aware of that fact.

3371. With reference to fixing a standard of 16 per cent., I am told that in a letter to the "Manchester Guardian," on 22nd August 1893, you wrote: "In speaking of butter I am speaking of a material which may contain as little as 8 per cent. or as much as 22 per cent. of moistnre"?—That is so.

3372. Perhaps you have seen that in prosecutions at Cork, which have been taken by the Cork Butter Organisation, they have prosecuted lately in all cases, or at any rate in cases of over 20 per cent. of water?—Yes.

3373. That is to say, in cases of 21 to 22 per cent.?—Yes.

3374. Do you think that that is a reasonable line to take, having regard to the difficulty of arriving at a standard; do you think that the Cork Butter Organisation have acted rightly in prosecuting where the proportion of water is more than 20 per cent.?—I am bound to say that I feel in rather a difficult position, because of that one fact, and I do not think it applies to any other country but Ireland; that there are a great number of very small farmers whose conditions are entirely different from those of anybody else. In the county of Lancaster, for example, the farmers have been complaining of the absence of proper dairies, and the attention of their lordlords, in fact, has been called to the matter, and something has been done to remedy the defect. Well, of course, the Lancaster farmers are men who have substantial houses, and substantial apartments in those houses which they can convert into a dairy if they choose at a moderate expense; but in the cases with which I am acquainted in the south of Ireland it is practically impossible for any of those men to make a dairy out of any apartment in their small cabins.

3375. You are aware, of course, that the particular part of Ireland which you visited, and are acquainted with, is not typical of the whole of the butter industry of the south of Ireland?—I quite understand that.

3376. But I understand you to say that in those particular districts the circumstances are so specially difficult for the farmers that you do not like to give an opinion as to a standard to guide us?—No; I have given my opinion as

Mr. *Dunbar Barton*—continued.

regards a standard, but I think that something might be done in cases of that kind, not to make an exception; I do not quite know how to put it.

3377. We would like to have your guidance because we want to make our butter as good as we can in Ireland?—I would give some little consideration if I were a magistrate or a prosecutor in a case where a man had no real convenience for making an article of produce which he must make if he is to live.

3378. There is only one other matter about which I want to ask you. How do you arrive at your standard of 16 per cent., without going into it in detail?—I think my standard was 15 per cent.

3379. I see at Question 2143 it is 15 per cent.; would you say how you arrived at it?—I have given considerable evidence upon the point. I arrived at it upon the basis of the analysis of the butters of almost every country.

3380. I will not trouble you to repeat anything that you have already said; but I want to ask you this one question. Do you know anything of the manner in which what is called ordinary salted or pickled Irish butter is made for keeping?—Yes.

3381. You know that is an Irish speciality?—Yes.

3382. Are you aware that that is made to keep for from three to six months for winter use?—Yes.

3383. Are you aware that in the making of that butter it is necessary to use rather more water in the manufacture than in the case of ordinary English or foreign butter used fresh every week?—That is quite a different point from the one that was raised just now. I am personally opposed to the system which is at present adopted in the manufacture of this pickled butter, because I feel convinced—indeed, it is admitted by some Irishmen themselves,—that it is sometimes a matter of fraud; that they add a very large proportion of brine to butter at a high temperature for the purpose, as some say, of increasing the weight or the percentage of water, and in other cases for preserving the butter for winter use. I do not believe that the large quantity of salt used in the form of brine is essential to make the butter keep for the winter, but I do believe that it adds to the weight, and consequently to the high percentage of water.

3384. Can you mention any other butter that will successfully keep in winter?—Wherever you make butter under the best system with 4 to 5 per cent. of salt, it will keep quite as well as the Irish pickled butter. I know that that is contrary to the opinions that were expressed in the Manchester market.

3385. But in order to prevent from 4 to 5 per cent. of salt from crystallising, is it not necessary to use from 12 to 15 per cent. of water?—From 12 to 13 per cent.

3386. I will take it from 12 to 13 per cent. Does it not follow from that that in the case of butter in which you have to use 4 to 5 per cent. of salt, there is at any rate likely to be more water than in the case of other butter, because you have this additional 12 to 13 per. cent. besides?—Besides the water of combination, do you mean?

3387. Yes?—I mean that altogether the moisture should not exceed 12 to 13 per cent.

3388. That is to say, not more than in the case of other butter?—No.

3389. Do you think that that would account naturally for there being more water than in other butter?—I think that the system of manufacturing with warm brine accounts for the excess of water in Irish pickled butter.

3390. You say that it may lead to fraud; but it may be done without fraud?—Yes, because it may be innocently or carelessly done, or it may be fraudulently done; but in either case I think it should not be done, and the consumer suffers just the same.

3391. What difference in the percentage of water would you allow between fresh and salt butter?—An immaterial quantity; one per cent. is sufficient.

3392. How do you account for that. If it takes 5 per cent. of salt to preserve butter that is made to keep from three to six months, and in order to keep from 4 to 5 per cent. of salt in solution, to prevent its crystallising, it is necessary to use from 12 to 13 per cent. of salt; the addition of 5 per cent. of salt consequently, according to you, only makes 1 per cent. addition of water?—What I intended to say was that from 12 to 13 per cent. of moisture was quite sufficient to retain the 5 per cent. of salt. As a matter of fact, I think it is pretty well proved by scientific investigation that the addition of salt to butter, under what I would term normal circumstances does not add to the percentage of of water at all.

3393. Could you suggest anything with a view to making Irish butter more pure. What particular line would it be; by prosecution, or by Government interference, or by instruction, or in what way do you think steps could be taken to secure Irish butter being more pure?—I look at the question in this way. The very small producer keeps one, two, or three cows, and he produces at every churning a very small quantity of butter. This he puts into his little firkin, and when it is full it goes to the market. It is impossible for his butter to be of good quality, because it contains so many different churnings that it is impossible for it to be all alike in character; and so far as regards water, for the same reason. Therefore I would suggest, so far as Ireland is concerned, the factory or creamery system.

3394. Co-operation, in fact?—Yes.

Mr. *Kilbride.*

3395. Are you aware that the Commissioners of National Education in Ireland have submitted a memorandum from the superintendent of the Albert Farm at Glasnevin, strongly deprecating the proposal to fix a standard as being prejudicial to the interests of the consumer as well as the producer?—I was not aware of that.

3396. That is in the correspondence that has taken place, I understand, between Somerset House and the Chief Secretary for Ireland?—I was not aware of that.

Mr. *Jeffreys.*

3397. Mr. Yerburgh, a member of this Committee, who is unable to be present, wishes me to ask you whether if margarine were imported in coloured packages it would not reduce the price of the article to poor people, that is to say, whether everybody would not then know that it was margarine, and consequently the price would be reduced?—No, I do not think it would. I think it would be a matter of custom; they would get used to it, as they have got used to many other articles of consumption.

3398. At any rate, they would know that they would not have to pay for anything but margarine if they saw these coloured papers?—That is so.

3399. Mr. Yerburgh also wishes me to ask you what you meant by saying that in Germany shops that sold margarine had to be registered?—What I said was that on every house of business in Germany where margarine is sold, it is essential in accordance with the law to paint on the outside "sale of margarine."

3400. And you would recommend that on shops that sold margarine in England?—Not essentially on the outside of the shops, but in bold letters somewhere.

3401. So as to notify the fact?—Yes.

3402. And with regard to separated milk, if it were proved that separated milk and fresh milk might be sold together as fresh milk, would not that be to the great injury of the farmer, because the separated milk could be sold at from 1*d.* to 1½*d.* a gallon, whereas the retailers would sell the mixture of good and bad milk at very much the price of fresh milk?—That is if they were sold together?

3403. Yes?—I do not see the way to prohibit that being done.

3404. But if that were allowed it would be doing a great injury to the farmer?—If the fraud were perpetrated it would be doing the farmer a great injury, as it does now; but the point is, that if this proposal were law, then the retailer would be doing it at very great risk.

Mr. *Channing.*

3405. I want to ask two questions to clear up points in your evidence. In the first place, did I rightly understand you to say that your experience was that the morning's milk was richer in fat than the evening's milk?—Yes, almost always.

3406. Was it the real morning's milk or the milk analysed in London which really was taken?—That was the milk obtained from the cows in the morning.

Mr. *Frye.*

3407. Early in the morning?—Yes.

Sir *Mark Stewart.*

3408. You found that the morning's milk was richer than the evening's milk?—Yes, always.

Mr. *Channing.*

3409. We have had evidence from other witnesses to the exact contrary?—Will you kindly put your original question again?

3410. The question is, whether you say that the morning's milk contained a larger percentage of fat?—I did not mean that; it is quite the contrary.

Mr. *Channing*—continued.

3411. That is what I wanted to clear up, Then you agree with other witnesses that the evening's milk contains a larger proportion?—There is about one per cent. difference in the total solids.

3412. Now another point. Will you kindly turn to Question 2209. You there expressed an opinion that it is not desirable to have a standard for solids not fat?—I did.

3413. How would you deal with a case of this kind. Supposing that a fraudulent dealer gave the top of a churn of milk to the inspector's substitute, or whoever took the sample, and that sample contained a rather large proportion of cream; and supposing that you had in such a sample a percentage of 5 per cent. of fat, and 12 per cent. of total solids, that would only leave 7 per cent. of solids not fat?—Yes.

3414. Would not that probably be a watered milk?—It would be indicative of something being very wrong.

3415. Then the percentage of solids not fat is of material importance, is it not, in relation to frauds?—In a case of that kind it would be; but that is so unusual a case that I do not think it need be provided for, because it would always be discoverable with the greatest ease.

3416. Is not that a stratagem that is frequently resorted to?—Not to give 5 per cent. of fat.

3417. But to take the top of the churn, which gives an unfair representation of the real quality of the milk?—To the inspector it probably is.

3418. In that case you might have a very high percentage of fat, and at the same time the whole of the milk in the churn might be considerably watered?—Yes; but I take it that any person who occupied a position of responsibility would, on no consideration, permit such a proceeding as that.

3419. But I should like to know whether you would not qualify your answer as to a standard of solids not fat. It is a matter of importance in determining cases of fraud, is it not?—I do not think it is, looking at it broadly. I think you would have a much greater ill effect if you established a standard for non-fatty solids than if you established none.

3420. You think that it would conduce to other kinds of fraud?—I think that is the whole crux of the question.

3421. Then perhaps, as it is a matter of great importance, you would explain your view upon that point?—If you established a standard of 9 per cent., for example, you would undoubtedly be subjecting many innocent persons to prosecution; because, as I have shown in many cases in evidence, a very large proportion of the milk of this and other countries contains less than nine per cent. of solids not fat; whereas, if you established a low standard, say 8·7 or 8·75 per cent., then you would be providing for a milk of low standard to the public. No harm is done to any one in the case of 3·2 for fat, and 12 per cent., as I propose, for total solids, whereas, you are ensuring milk of high quality.

3422. And you think, on those grounds, that it would be dangerous to fix by law a standard of solids not fat?—I do.

The Witness handed in the following Table :—

AVERAGE Wholesale Prices per lb. of the Finest Danish Butter.

——	1881-82.	1882-83.	1883-84.	1884-85.	1885-86.	1886-87.	1887-88.	1888-89.	1889-90.	1890-91.
	s. d.	*s. d.*	*s. d.*	*s. d.*	*s. d.*	*s. d.*	*s. d.*	*s. d.*	*s. d.*	*s. d.*
November	1 4½	1 3	1 3½	1 2¼	1 1½	1 1	1 -⅜	1 -¼	1 -⅛	1 1
December	1 4¼	1 3½	1 3	1 2⅛	1 -⅜	1 1½	1 -½	1 1½	1 -⅜	1 -⅜
January	1 4½	1 2⅜	1 2⅛	1 1⅜	1 1	1 -½	1 -	1 -⅜	- 11⅜	1 -½
February	1 4½	1 3½	1 3	1 -⅜	1 -¼	- 11⅛	- 11⅜	1 1	1 -	1 -
March	1 4	1 2⅜	1 1⅜	1 -⅜	- 11½	1 -	- 11⅜	1 -½	- 11⅜	1 -⅜
April	1 3⅜	1 -½	1 -⅜	- 11⅜	- 10½	- 10½	- 10	- 10⅜	- 11¼	- 11
May	- 11⅜	1 -½	- 11⅛	- 10½	- 10	- 9¼	- 9⅛	- 10¼	- 10	- 9⅛
June	1 -	1 -	- 11	- 10¼	- 9	- 9½	- 10½	- 10⅛	- 9¼	- 9⅛
July	1 -¼	1 -¼	- 11¼	- 10⅜	- 10¼	- 11	- 10⅜	- 11	- 9¼	- 10¼
August	1 -½	1 -⅜	1 -½	- 11⅜	- 10⅜	1 -¼	- 10½	- 11	- 10	- 10⅜
September	1 1½	1 1	1 1⅜	1 1	- 11½	1 -½	- 10⅜	- 11¼	- 11½	- 11½
October	1 2½	1 2¼	1 3¼	1 1⅜	1 1¼	1 1½	1 -¼	1 -	1 -½	1 1

Wednesday, 1st August 1894.

MEMBERS PRESENT:

Mr. Channing.
Mr. Colman.
Sir Walter Foster.
Mr. Frederick Frye.
Mr. Jeffreys.
Sir Mark Stewart.
Mr. Whiteley.
Mr. Yerburgh.

SIR WALTER FOSTER, IN THE CHAIR.

Mr. SAMUEL WILLIAM FARMER, called in; and Examined.

Mr. *Channing.*

3423. YOU are a large Farmer in Wiltshire, I believe?—I am.

3424. And a Member of the County Council?—I am an Alderman of the Wilts County Council.

3425. How much land do you farm?—Upwards of 10,000 acres.

3426. And you send milk on a very large scale to London?—I do.

3427. Would you state to the Committee what the average amount that you send to London is?—As you may imagine this large acreage is extended over a considerable area, and we send milk from some 16 different herds of cows; they are all dairy shorthorns, the herds varying in number from 40 to 80 in each herd.

Mr. *Frye.*

3428. Most of your land, I suppose, is pasture?—No, the larger proportion of it is arable land. We have all kinds of land; we grow large acreages of corn, and keep large quantities of sheep.

Chairman.

3429. All these separate herds are under your management, and you know all the details of sending milk to London, and so on?—Yes.

3430. Would you state where you send your milk, and how it is disposed of?—The milk is principally sent to different firms in London, particularly to the Aylesbury Dairy Company at Bayswater.

3431. How much do you supply them with on an average?—It is now about 1,500 gallons a day; sometimes more and sometimes less.

3432. What is about the total amount that you send up to London from your various herds?—From 1,000 gallons per day to about 2,000 gallons a day, according to the time of year.

3433. Do you send the supply of milk under any contract as to the constituents and composition of the milk?—Yes, my contract is that the milk shall contain not less than 3·25 per cent. of fat, and we have had no difficulty at all in keeping up to that standard; in fact our average is considerably above that. I think that out of 10,000 churns sent during the last six

Chairman—continued.

months we have only had 16 churns as low as 3·25 per cent. and only three under that standard.

3434. Are the churns separately analysed?—I cannot state that every churn is analysed, but our position is this: that directly any churn approaches in analysis near the 3·25 per cent., the limit of the contract, they at once advise us of it.

3435. The Aylesbury Dairy Company?—Yes.

3436. Do you supply much milk from single cows, or is this invariably mixed milk from large numbers of cows?—It is invariably from herds of cows; we do not send milk from single cows at all. Shall I give you some figures as to that?

3437. If you would give us some figures I think it would be desirable?—We find, at least I am informed by the Aylesbury Dairy Company, that the following are the averages of our supplies during the past six years. The six years average has been 3·84 per cent. of fat, and 8·92 per cent. of solids not fat.

3438. That is a six years average?—Yes; the highest yearly average has been 3·92 per cent. of fat, and 9 per cent. of solids not fat; the lowest yearly average has been 3·80 per cent. of fat and 8·87 per cent. of solids not fat. The highest monthly average has been 4·24 per cent. of fat, and 9·17 per cent. of solids not fat; whilst the lowest monthly average at any time has been 3·56 per cent. of fat and 8·84 per cent. of solids not fat.

3439. These percentages are ascertained by the analysts of the Aylesbury Dairy Company?—Yes; that is so.

3440. Have they, till quite lately, been determined by Dr. Veith?—Yes; and from these figures, and the very few instances in which we have had anything as low as 3 per cent. (only three churns out of 10,000 sent to them during the last six months) I am of opinion that any herd of cows properly nourished would produce milk with 3 per cent. of fat.

Mr. *Frye.*

3441. What breed of cows are yours principally?—Dairy shorthorns.

Mr. *Channing.*

3442. You do not supply milk from single cows, I understand?—No; we do not.

3443. But have you considered the tables which have been handed in by the Aylesbury Dairy Company as to their results?—From single cows, do you mean?

3444. Yes?—Yes; I have seen them.

3445. They are not derived from you then?—No; they are not derived from me.

3446. Is there anything that you wish to add as to the analyses?—No; I think not. I might observe that there are very large supplies of separated milk now sent to London, extremely large supplies; and it seems to be especially in times of scarcity and high prices. These supplies of separated milk seem to be increasing continually.

Mr. *Frye.*

3447. I suppose you do not make any butter?—We do not make any butter if we can sell the milk; but in times when there is an over supply of milk we then separate the milk; we have two separators, and make butter.

3448. Do you send the separated milk to London?—No, we do not; we give it to the pigs. I should not say that we never have sent it, but it is an extremely rare thing to have done so.

Mr. *Channing.*

3449. In your opinion, the use of separated milk to adulterate whole milk has increased during these last few years of depression?—I have no doubt that it has; it increases very largely, especially in times of scarcity and high prices. When there is an over-supply of milk, there is no temptation, of course, to use the separated milk.

3450. Was that especially the case last year when the supply of milk was scarcer?—It is difficult to say when it does apply, but it applies whenever there is a scarcity. It seems to me that the adoption of a low standard under those circumstances would practically legalise adulteration.

3451. What do you call a low standard?—I think anything below 3 per cent. Seeing that I, from my herd, have only had so small a number less than 3·25 per cent., if you put anything below 3 per cent. it must be called a low standard. It would be much better to have no standard at all than a low one.

3452. Have you formed any opinion as to how you would state your standard; would you have a standard of the proportion of fat and the total solids, or would you have a standard of the proportion of fat and of the proportion of solids not fat?—It appears to me that that is a question rather for analysts to determine, seeing that the evidence which I am giving is rather bearing on the fact that there is no occasion to supply from a herd of cows a low standard of milk. That is practically what I want to show.

3453. You have not formed an opinion as to whether the fixing of a legal standard of non-fatty solids would operate unjustly or encourage adulteration?—No; I have not felt myself competent to form an opinion on that subject.

Mr. *Channing*—continued.

3454. You think that the test of the value and purity of the milk is practically to be found in the proportion of fatty solids?—That is as it has occurred to me.

3455. Have you any evidence to give us as to the feeding of your cows, and the results of feeding?—I can answer any questions that you would like to put to me upon that matter.

3456. I understand you to say that the whole of these herds are dairy shorthorns?—Yes.

3457. Are they all managed on the same principle, and on pretty much the same land, or does the land vary?—The land varies very considerably, but they are all managed on pretty much the same principle.

3458. Will you state how they are fed, and give us an idea of the ration that you give your cows?—In the summer time when the cows go to grass, first of all, and the grass is young and succulent, we should give them a moderate quantity of cotton cake.

Sir *Mark Stewart.*

3459. How much?—Four pounds.

Mr. *Jeffreys.*

3460. Four pounds a head?—Yes.

3461. When is that?—When the grass is young and succulent.

Mr. *Channing.*

3462. How long do you continue that?—Probably till the first week in June, till the grass begins to get older and more hearty.

3463. About three weeks would that be?—Practically a month. I am giving, of course, general ideas; circumstances may arise under which we alter it; for instance, if we had a very rainy time and the grass was still young and succulent in August.

3464. The object of my question is this: you stated your experience to show that a high average percentage of milk is perfectly ascertainable, and I want to bring before the Committee, therefore, how your cows are fed; would you continue your statement as to that?—After that date, until the cows were stalled in the winter, they would simply get the grass.

Sir *Mark Stewart.*

3465. That is till the middle of November?—Yes, till the middle of November.

Mr. *Jeffreys.*

3466. After that you give them nothing but grass?—Or a few roots or cabbages if they happened to get short; but practically grass is the general food of the cows.

Mr. *Channing.*

3467. One witness has stated the exact quantity that he gave the cows, of beans, peas, and pulped roots, and so on; are you in a position to give us figures as to those proportions?—I can give you figures; they vary according to the qualities

Mr. *Channing*—continued.

qualities of the food produced on the farm at different times. If we had in certain seasons a poor quality of hay, for instance, or a poor quality of fodder generally, we should then give a better food: we should give more linseed cake or perhaps a little boiled linseed, or something of that kind.

3468. Do you think that the steaming of the food has any effect on the milk?—I have no experience. I should think that probably it has. But we could not possibly steam for so large a number of cows as ours; we should not have the appliances to do it.

3469. Do you give them much bean and pea-meal?—During the winter-time, when they are stall-fed, we give them chopped straw, oat-straw, and hay, with pulped roots.

Sir *Mark Stewart.*

3470. What proportion of hay and straw?—They have what they would eat *ad libitum.*

3471. Of either?—More straw than hay, a good deal. In some seasons the straw is a good deal better than the hay is in other seasons.

Mr. *Channing.*

3472. Then what quantity of pulped roots would you give them?—If we had a good supply we should give them as much as half a hundredweight a day each, and in a season when roots are scarce they might drop down to very little, perhaps no more than 15 or 20 lbs. each.

Mr. *Frye.*

3473. Do you give them any grains?—None at all.

3474. You cannot get them, can you?—No.

Mr. *Channing.*

3475. You give them no brewers' grains?—No. Then we give them probably a mixture of bran, cotton cake, decorticated cake, and at times linseed cake, and maize-meal, and malt-culms, about from 8 to 10 lbs. a day each during the winter.

Mr. *Jeffreys.*

3476. What proportion of cake?—Which kind of cake are you speaking of?

3477. Decorticated cake in the winter?—We give them about one-third of that; about one-third of the food would be cake of some kind.

3478. How many pounds?—It would be about 3 lbs., but if we had, as we did in 1888, very bad food indeed, to a large extent all the fodder spoilt, we should get up as high as 12 lbs. of cake, because the food produced on the farm was so inferior in every way that you could not nourish your cows with it.

Mr. *Channing.*

3479. Do the prices vary?—Yes; you may take it that they would average from 8 to 9 lbs. each of the mixed food during the winter months, and in a bad season they would get up as high as 12 lbs.

3480. Do you find very much difference in the results, for instance, from pea meal and maize?—We know the result in quantity more than we do in quality. We only are found fault with for quality when we drop too low. The analyses are not given to us; but, as a matter of fact, during the seasons in which we had a very bad quality of fodder on our land, we found that the addition of linseed, either in the shape of boiled linseed, or crushed linseed, or linseed cake, certainly affected the quality of the milk.

3481. You think that the oily food affected the quality of the milk?—There is no doubt that it did with linseed.

3482. That it increased the proportion of fatty solids?—Yes.

3483. Did you notice the proportion of increase of fat produced by any specific addition of food?—No; all I know is that it gave satisfaction directly; we were well above our contract standard of 3·25 per cent.

3484. But is your evidence, then, that food has much bearing on the quantity of fat in milk?—Undoubtedly; if you give linseed you can increase the fat. A man with two or three cows knows that if he gives his cows linseed cake he makes more butter directly in that week; whereas if he gave them maize meal, he probably would not make more butter.

3485. You are aware that that opinion is not shared by a good many agricultural authorities?—Yes, I have heard that it is not.

3486. Your experience is to the contrary effect?—My experience is distinctly that if you give linseed cake to a cow, you can make more butter from her when she is having that than if you gave her maize meal. I cannot say about the analyses, because we do not get the analyses.

3487. To sum up this question of food, would you say that your cows are fed much more highly than the average cows of farmers who do their work well?—Not as you put the question; not as farmers who do their work well. I should say that my cows are decidedly well nourished.

3488. They are fed up to the average, but not exceptionally fed; they are not forced in any way?—They are kept well.

3489. And I suppose when they are dry you make a difference?—Then we try to keep them almost as barely as we can.

3490. You do not give them any rich food, then?—No.

3491. So that on the whole their condition after calving would not be very high?—Our cows generally calve down well, but we do not force them at that time. We give them plenty of good food when in milk.

3492. You expressed the opinion that if a low standard were adopted it would encourage adulteration?—I have no doubt about it at all.

3493. And that is established, is it not, by the figures that you have laid before the Committee, that is to say, that with those figures you find no difficulty in producing an average considerably over your contract, I see?—Yes, the lowest monthly average that we have ever sent up has been 0·21 beyond the contract standard; we have been 3·56 per cent. at the lowest.

3494. If therefore a standard of 2·50, or even of 2·75 per cent. were adopted, it would be possible to add a considerable proportion of separated milk, and still to find in a sample of the mixed milk the fat required by such a low standard?—I think

Mr. *Channing*—continued.

I think so, certainly. I think that there are many milkmen in London who buy milks which they can rely on as being especially rich, in order that they may, in times of scarcity, be able to adulterate them.

3495. Have you any opinion to offer as to the results of the percentage of fat in the milk of single cows; have you any evidence of your own to offer on that point?—No, I have not.

3496. You are aware though that the evidence as to single cows, as laid before the Committee by the Aylesbury Dairy Company, shows that only about 10 per cent. or 15 per cent. at the most, fall below the standard of 3·20 per cent.?—I should think there were very few cows that fell below that, comparatively not so large a percentage as you say.

3497. The percentage in these tables shows that about 10 per cent. of the cows fell below 3 per cent., only about 10 per cent. of all the single cows whose milk has been analysed?—I cannot speak on that point.

3498. I only want to ask you this question: whether with your very wide experience of dairy farming, your own experience of cows corresponds to that; that the proportion of such cows as an ordinary good farmer would have which would give milk below your standard is comparatively small?—I should say very small indeed, and I should have thought much smaller than the figures which you imply are in the papers of the Aylesbury Dairy Company. I should have thought that it would not be anything like 10 per cent. of the cows that would not give that quality of milk.

3499. Your own impression is that 10 per cent. is rather a high average?—I should think a high average for properly nourished cows.

3500. That even a smaller percentage than 10 per cent. would be found giving less than 3 per cent. of fat?—Yes, I should think so.

3501. I believe you wish to say something about the right of dairymen to appeal to the cow in case of prosecution?—I think that adulteration is at times so remunerative that fines are practically useless as a deterrent, and I think that nothing but imprisonment has any chance of stopping it; and then in order to avoid injustice in a case of that kind, I would give any man the opportunity of appealing to the herd of cows itself to show whether the cows did give the poor milk which he claimed that they gave.

Mr. *Frye.*

3502. But what use would that be; how could you tell what cows this particular milk came from?—I am taking it that it would be possible to trace the milk; of course, if it is not possible to trace the milk you could not do it.

3503. Do you think that it is possible?—In some instances perhaps it would not be possible.

Mr. *Channing.*

3504. But in your own case how would such an appeal be workable. You have these large herds, and you would not be able to appeal to the whole herd of cows?—In my case the thing would be perfectly easy. I can quite see that there would be difficulty in some cases, but I could tell you what cows or what herd of cows every churn of milk came from.

Mr. *Channing*—continued.

Mr. *Frye.*

3505. But we have got other people to deal with, not you?—That is so.

Mr. *Channing.*

3506. Would you explain how your idea of the appeal to the cow would work; you would only apply it I suppose in the case of small farmers?—I should apply it where I could trace it. If you cannot trace it, it is of course impossible to apply it. That is a difficulty that had not occurred to me.

3507. Have you not some evidence to give us as to the general conduct of the dairy trade in London?—I do not think I have anything further to say than what I have already stated.

3508. Have you no experience of the milk testing trials carried out at the British Dairy Farmers' Shows?—No, I have not.

3509. Then you would not be able to say whether trials of that kind would be a fair general test of the productive powers of cows?—I should think that probably in those cases the cows were picked cows, but I do not know; I could not give any evidence as to that.

3510. They give very large figures; I thought perhaps that you had some experience on that subject?—No.

3511. Now as to the sampling of milk, have you any experience as to the sampling of milk in cases of alleged adulteration?—No, I have not.

3512. Have you any other points which you wish to bring before the Committee?—It appears to me that so far as margarine is concerned the whole object of colouring it is fraud.

3513. Have you a committee on the Wilts County Council dealing with questions of adulteration?—No, we have not.

3514. Have you taken any action with regard to butter frauds yourselves?—We have a county analyst and we have an inspector, who take samples, but very little has been done in the matter.

3515. Have you any evidence to offer us as to that?—No.

3516. Except that in your opinion margarine should not be coloured?—It should not be coloured.

Sir *Mark Stewart.*

3517. Do you think that if margarine was not coloured fraud would be prevented?—I do not think it could be sold as butter under those circumstances.

3518. And what effect would that have upon the butter market?—I have not considered the effect upon the butter market; I was considering the effect on the public that they would not buy for butter what was practically a totally different substance.

3519. Have you ever considered the plan which we have had sketched out in this room of having two counters, one for margarine, and one for butter, in the same retail shop?—No; I have not.

Sir *Mark Stewart*—continued.

3520. In regard to the appeal to the cow, do you weigh all the milk of your different cows?—Yes; it is not weighed every day; we weigh the milk of the different cows once a week.

3521. And do you test the milk of each cow?—For quantity, but not for quality.

3522. Then in fact you test each churn?—I do not understand your question.

3523. Do you test the quality of each churn of milk occasionally that you send away?—No; we do not test our milk at all; it is tested by the purchasers of the milk.

3524. Then you do not test it at home?—No.

3525. You have no Babcock system then, or anything of that sort?—We have none; we have no time to do anything of that sort; it is all sent away at once.

3526. Do you see much difficulty in the way of any ordinary farmer arriving at a just conclusion as to the quality of the milk?—I do not think it would be very reliable.

3527. Mr. Channing asked you whether you would recommend an analysis in the case of large dairies as well as in the case of small dairies, and my point is to know whether you think that there would be any real difficulty in the case of small dairy farmers arriving at a fair conclusion as to the quality of their milk without testing it at home?—I do not think they could test it at home reliably, not the dairy farmers themselves.

3528. You do not think that they have the appliances or the knowledge?—No; or the skill.

3529. Do you give any bean meal to your cows?—Not often.

3530. You prefer the pea meal?—It is seldom that we use either pea or bean meal; we do use pea and bean meal occasionally, but we use a great deal of maize meal.

3531. Chiefly decorticated cake?—And cotton cake, and linseed cake.

3532. Decorticated cotton cake?—Yes.

3533. You do not find that it gives a taste to the milk?—No.

3534. Have you ever heard that it gave a taste to cheese made from the milk of cows fed by decorticated cake?—I have not.

3535. What amount of grass do you allow to each cow for grazing?—The cows eat grass *ad libitum*; they are out in the meadows eating what they please.

3536. But in regard to acreage; do you allow an acre per cow?—It varies very much according to the farm; it depends upon whether you want it simply to summer them or to winter them too.

3537. And your evidence is that you think that 3·25 per cent. of fat and about 8·92 per cent. of solids would be a fair average?—No; I did not say that. I said that my contract was 3·25 per cent. of fat, but I think that if a standard is fixed it should not be less than 3 per cent.

3538. You advise a standard of 3 per cent., if there is to be a standard?—Not less than 3 per cent., certainly.

3539. And how much of solids?—Perhaps 8·5 per cent., I should think; but that is rather a question for the analysts, I think.

Mr. *Channing.*

3540. I think you rather declined to express any opinion as to the question of a standard for non-fatty solids?—Yes, I did.

Mr. *Jeffreys.*

3541. You said that your contract was 3·25 per cent. of fat; what was the solids not fat in your contract?—8·75 per cent.

3542. You omitted that, I think?—Yes, I did not state that.

3543. Then your contract is for a very high standard, is it not?—Out of 10,000 churns I have only had 16 as low as the standard during six months.

3544. And yet from several other witnesses we have had evidence that they think 8·5 per cent. a good average for solids not fat, and 2·75 per cent. for fat; and they thought that 11·5 per cent. was a fair average?—My experience goes to show that that would be a very low quality of milk indeed.

3545. And they thought that if such a standard as that were fixed, there would be a fear that good milk would be watered down to it?—Yes.

3546. Do you think that rich milk is now watered down to a certain standard?—I have not the slightest doubt that in time of scarcity and high prices, rich milks are bought purposely that they may be lowered down in that way.

3547. And the dairymen give rather a higher price for rich milk, do they not?—They secure them if they possibly can.

3548. Channel Islands milk, for example?—Yes, but it is difficult to get it.

3549. Do they buy that to water down?—I do not think they can get it to water down; it would be bought, probably, for special purposes.

3550. Would you not be afraid that if you fixed your standard too high, some cows that were poorly fed (not so highly fed as yours) might not come up to the standard, and so you would cause hardship to small owners?—That is why I have taken the figure of 3 per cent.—much lower than my contract of 3·25 per cent. Our cows, when they have been feeding only on grass, have not dropped so low as 3·25 per cent. In the month of May, which is probably a low month, when there is a large quantity of grass, the lowest monthly average was 3·56 per cent.

3551. But during that time you said that you gave them 4 lbs. of cake a day?—That is really to keep the grass in them; otherwise the succulent grass runs through them.

3552. Does not that consequently improve the richness of the milk of the cow?—Yes, of course it does. If a cow has diarrhœa she cannot give that milk.

3553. Then during that time the cow is not badly fed, because she gets the grass and 4 lbs. of cake a day?—We do not feed our cows badly. I say that all cows ought to be properly nourished.

3554. But you can understand a case where a small man could not give his cows so much cake a day, and would feed them on grains instead; would not that reduce the quality of the milk?—

Mr. *Jeffreys*—continued.

Then if he were a small man, the difficulty would not arise in tracing the milk to the cow.

3555. In that case, with an appeal to the cow, you would not subject a man to a penalty?—You could not call it adulteration.

3556. If we passed an Act to fix a standard, you would say that, notwithstanding the fixed standard, if there was an appeal to the cow, as it is called, and it was proved that the milk came direct from any cow, you would not prosecute the man?—If it could be clearly shown that the milk was pure and unadulterated, I would not prosecute.

3557. Have you had much experience of this mixing of separated milk with fresh milk, and selling it as pure milk?—We know, as a matter of fact, that during times of scarcity very large supplies of separated milk are sent to London daily, and go into the hands of milkmen here; and the greater the scarcity of milk in London the greater the supply is of separated milk.

3558. Is not this mixture, when it is sold as fresh milk, a clear fraud upon the purchaser?—I think it is, undoubtedly.

3559. And you wish to stop it by every means in your power?—Yes.

3560. Not that you or anybody would wish to forbid the sale of separated milk, as such?—No.

3561. But you would wish to forbid a mixture of separated milk and fresh milk being sold as fresh milk?—Yes.

3562. And, so far as you know, is there a good deal of fraud in that way carried on?—I think there is a very great deal, and increasingly so, especially in winter times and times of scarcity. It is not a daily occurrence, as there are times when there is an over-supply of milk in London, and then there is no temptation to adulterate with separated milk; but directly the temptation arises there is no doubt that it is carried on to a very large extent.

3563. And I suppose that these dealers purchase this separated milk at about a penny or three-halfpence a gallon and mix it with fresh milk, for which they have to give 7*d.* or 8*d.*?—Yes; practically the difference would be that the separated milk would be 20 per cent., or one-fifth the value of the other; from a fourth to a fifth of the value of the other.

3564. And, of course, if they could mix these two milks and palm them off upon the public as fresh milk, they would make an immense percentage on that?—Very large profits.

3565. How would you propose to stop that?—It seems to me that it might be desirable to offer rewards to any person who will give such information as will lead to conviction for adulteration. There must be plenty of people here in London who assist in that mixing, servants, and so on, and in different ways. I think that we might not only have the evidence of the analyst showing that it is below the standard, but we might also get the evidence of the people themselves who actually did it, if a reward were offered, or a portion of the fine, or some means of that kind were adopted.

3566. But supposing that the rich milk were mixed with the separated milk, and yet it came up to the low standard which some people have suggested of 11·5 per cent., would you prosecute them?—Does not that matter answer itself, if it is below the standard.

3567. Yes; but you would wish to prosecute anybody, I suppose, for making up this mixture and selling it as pure milk, for trying to palm off a fraud upon the public, whether it comes up to the standard or not?—Yes, certainly.

3568. Then I ask how are you to detect it, if it comes up to the standard of 11·5 per cent.?—You cannot detect it unless you can get evidence of the actual mixing.

3569. You think that the only way would be to induce those people to inform against their own employers, in fact?—Yes.

3570. That is the only way that you can see of detecting it?—It would be quite possible, although it might be difficult, to trace the milk from its source. Separated milk is sent to London, and it is matter of common knowledge where it goes to: to people in the trade; what do they do with it?

3571. I suppose that such a thing as this adulteration is seldom or ever done by the farmers themselves?—The farmers themselves in very few instances have separators, so that they have not the separated milk to adulterate with. Of course I am not saying that farmers are entirely free from fraud in any kind of way; there are dishonest men amongst farmers as amongst other classes, and they will adulterate with water.

3572. But still we have had evidence to show that it is very seldom that this milk is adulterated at the source?—It is not adulterated with separated milk at the source.

3573. We have heard that it would be a great assistance in detecting these frauds if there were more inspectors going round the country, and going into the various shops; do you think that there is not sufficient inspection of milk?—I do not think there is.

3574. What happens in your county; do not the police inspect samples of milk?—No, they do not. I should not like to speak very clearly about it, but I believe that our inspectors do those things.

3575. Inspectors of what?—I think it is the Inspector of Weights and Measures, but I am not quite certain about it.

3576. Yes, it is; but it is under the direction of the chief constable of the county?—Yes.

3577. Does not your chief constable give instructions to take these samples of milk occasionally?—The whole of the administration of the Adulteration Acts in our county is under the General Purposes Committee of the County Council; I have not been on that Committee now for some two or three years, and I do not know what the exact practice in Wiltshire is in that respect.

3578. Would it not be worth while for gentlemen like yourself on these county councils to ask questions, and to see that the chief constable instructs the inspectors to take more samples of milk in the towns?—Yes, I think it would be.

3579. That would be one way of detecting fraud, would it not?—Yes.

3580. Because

Mr. *Jeffreys*—continued.

3580. Because we hear that in many counties the samples taken are totally inadequate to the number of shops and retailers in the county?—That is so.

3581. But you would not advocate any further form of inspection, would you. For instance, have you heard that some people advocate travelling inspectors to test milk and butter?—A travelling inspector would not be open to be tampered with; it is very possible that he might get cases of fraud where a local man would not be able to do so.

3582. You see that our difficulty is how in many cases to detect the frauds. You may say that you know that there is a good deal of fraud, but it is a very difficult thing for you to give evidence, or for anybody else to give evidence, about it?—Yes.

3583. Therefore, how is it to be suppressed?—I cannot say that; I have given that matter very great consideration, but I did think that it might be desirable to offer a reward to any person who would give information leading to conviction for adulteration.

3584. Do you know much about the adulteration of cream in London?—No.

3585. You do not supply cream?—No.

3586. Who supplies the cream in London; there is a great deal of it consumed?—There is a great deal of it made in London.

3587. Do you know how it is made?—By separators, made from the milk.

3588. Is it not occasionally made from other substances as well?—I am afraid that I cannot give any evidence on that point. I have thought so, when I have been eating it sometimes.

3589. With regard to the feeding of your cows, would you give them grains if you could get them in the winter?—Not except under very exceptional circumstances; not unless I had no roots, for instance.

3590. And if you had no roots and were badly off for hay, as a good many people were last year, and you gave your cows grains, would not that reduce the standard of milk considerably?—Then I should at once give them better food, to keep up the standard condition of my cows; if I gave them grains and nothing else, I should soon expect to get my cows ill.

3591. In making contracts with dealers, is it a general thing to put a certain standard in the contract?—I do not think it is.

3592. Then yours is an exceptional case?—I think the Aylesbury Dairy Company are more particular in that respect than any other company; some other companies do it, I know.

3593. In delivering milk in great quantities under ordinary circumstances is there any great difficulty in keeping the milk up to the average quality, or does it vary according to hot weather or cold weather?—Milk varies, but there is no difficulty at all in keeping it up to the standard that I have mentioned.

3594. To the standard in your contract?—Yes; as you see our lowest monthly average is 3·56 per cent. of fat, and there are only 16 churns from the 1st of January to the 30th of June, which would take in cold months and hot months too, in which we have dropped as low as the contract quality, that is 3·25 per cent.

Mr. *Jeffreys*—continued.

3595. When did your highest monthly average of 4·24 per cent. of fat take place; what month was it?—January.

3596. Were you feeding very highly at that time, or what made the average go up so high?—I have not the year in which that occurred, but it is possible that the food just in that month may have been better; I mean the food produced on the farm. We may have been at a better lot of fodder, or a better hayrick.

Mr. *Channing.*

3597. How long would those cows have calved, on an average, after January?—On an average the cows, in January, would have calved perhaps from three to four months, say four months.

3598. Not longer than that?—No.

Mr. *Jeffreys.*

3599. May I ask you again what average do you propose, or would you suggest to make a standard. You have heard of other averages which have been suggested which are much lower than yours. What is the average which you would like to suggest to be the standard for testing milk?—If there is any standard at all, it should not be less than 3 per cent. of fat.

3600. And of solids, not fat?—I would rather leave that to others. I know more about the standard of fat than I do of solids not fat.

3601. Then you think that in a general way you would like to test milk by the fat?—I should; from my point of view I should have no difficulty.

3602. In your contract you have only a contract for milk of a certain standard of fat?—No; we contract for a certain standard of solids not fat, and the lowest that I have had has been 8·84 per cent.

Mr. *Channing.*

3603. Your contract being 8·75 per cent?—Yes; and we have been as high as 9·17 per cent. There is no occasion to be lower than 8·75 per cent.

3604. As a matter of fact, there is much more uniformity in the analyses of non-fatty solids than there is in the analyses of fat, is there not?—Yes.

3605. The range of variation is much smaller?—I find, as a farmer, that I need not trouble my head about solids not fat; if I can keep up the fat, I have no difficulty about the other. That is practically how I work.

Mr. *Jeffreys.*

3606. Have you any other suggestion to make to the Committee as to legislation, in order to protect the public from fraud on account of this adulterated milk?—No, I do not think I have.

3607. But you know, as a matter of fact, that milk is greatly adulterated?—Yes, and I think that steps should be taken to stop it as far as possible.

3608. That is sometimes a difficult matter, is it not?—Yes, it is.

Sir *Mark Stewart.*

3609. Do you turn out your cows at all in the winter?—Only for a very short time.

3610. Just to get a drink of water perhaps?—Yes, partly for that and partly that we may see whether they are at service for the bulls.

3611. Do you give them water in the house?—Yes.

Mr. *Frye.*

3612. Do you know of any dealers who buy separated milk for the purpose of mixing it?—I know many dealers who buy separated milk, but when you say for the purpose of mixing it, it is not for me to say what it is bought for.

3613. You said that you would prevent margarine being coloured. You know that butter also is coloured?—Yes.

3614. Would you prevent that being coloured also?—Butter is not coloured for the purpose of being sold as a superior article; it is not coloured for the purpose of fraud. Margarine is churned and coloured for the purpose of selling it as something which it is not.

3615. What effect would that have on the price of margarine, do you think?—I do not think it is a question how it affects the price; it is a question of fraud, whether you sell to people one thing when they think they are buying another. I should not put it on the question of how it would increase or diminish the price.

3616. I suppose it would increase the price of butter?—I have not viewed it from that point at all. I make very little butter, and it is not a matter that concerns me.

3617. There are mixtures of butter and margarine. You could not prevent them being of the natural colour; would you prevent their being mixed at all?—I think if a person wishes to have them mixed he might mix them himself.

3618. How is that to be done, supposing that they wished to have a mixture?—I think it might be left to him to decide. If any person wished to use a mixture of butter and margarine, we might leave it to him to decide how he would mix them. Personally I cannot conceive that I, at any rate, should wish to use a mixture of the two.

Mr. *Yerburgh.*

3619. I want to ask you a question upon the effect that food has upon the milk of cows. Is there any form of feeding cows which will increase the quantity of milk given, and at the same time depreciate the quality?—Yes, there is undoubtedly.

3620. What kind of food would that be?—We know that brewers' grains, for instance, will materially increase the quantity, and we know that a large quantity of roots will increase the quantity, and I have found that a certain preparation of maize will increase the quantity; but those things, unless assisted by better foods at the same time, decrease the quality, and we have to give with them a better kind of food, like decorticated cotton cake, or linseed cake, or linseed meal.

3621. Then I gather that if you had a low standard for milk, anybody who wished to get a large yield from his cows, would adopt such a method of feeding, and by that means get a

Mr. *Yerburgh*—continued.

larger result?—Yes, he would get a larger result.

3622. At the cost of quality?—And of the cows, because the cows would not be properly nourished, and they would get in a low state of health under those circumstances.

3623. Then apart altogether from such a system of feeding cows, I gather that if we adopted the standard that you propose, that would put a stop to any such system of feeding cows is simply to increase the quantity at the cost of the quality of the milk?—A man would naturally, of course, feed his cows so as to produce the proper standard of milk.

3624. Therefore any custom such as that, under such a proposal as yours, would be stopped?—Yes; I cannot think that such a custom prevails to any extent as to feed with such a bad quality of food entirely. I do not know.

Mr. *Colman.*

3625. Have you any knowledge of the colouring of milk?—I have no knowledge of that; I believe there is such a practice.

3626. You mean that from your own herd the milk would go entirely uncoloured?—Yes.

3627. I think we have had evidence to the effect that a very large proportion of the milk sold in London is coloured; have you any knowledge of that?—I can simply give an opinion; my opinion is that there is very little milk sold in London which is not coloured more or less.

3628. Then it would be coloured by the milk sellers or dealers in London, I take it?—Yes.

3629. You think that as a rule, then, the farmers who send milk to London do not colour their milk?—I have never heard of such a case. I might say that they do not do it.

3630. You said something about brewers' grains which you could not get; have you any objection to them as food for cows?—I should prefer not using them myself. I do not know that there is any objection where a man cannot get roots, provided that he gives other good food. Brewers' grains in themselves are not a rich food, and if a man can get a good supply of brewers' grains, and cannot get the roots if he gave another kind of food to make the bulk of the food a rich food, or good nourishing food, there would be no objection to them.

3631. You mean that they would tend rather to quantity than quality?—Certainly; if you give brewers' grains and nothing else, you would get a very poor milk.

3632. But I suppose that in the immediate neighbourhood of large towns where there are brewers, they are used to a very large extent?—I believe that is so.

3633. You thought that there were not many cows that gave a poor quality of milk; but do those cows give extra quantity when they do not give quality?—I always put in, where the cow is properly nourished. If you give a cow a lot of mouldy musty hay, or if a cow in a very dry summer practically gets no food at all, has to work hard for its living, and gets nothing to supplement it, the cow in a sense is starved, and then the natural result would be that the cow is not nourished, and she cannot give good milk.

Mr. *Colman*—continued.

3634. Is it the rule, do you think, that where there are cows that give a poor quality of milk they give an extra quantity?—Speaking generally a cow that gives a very large quantity would not give so good a quality, but I do not think that that is a uniform rule.

3635. I understood you to say that few farmers have separators, but are not separators getting much more common than they were?—Yes, but men who send milk to London as a rule send the whole of their milk, and they have no occasion to buy separators, and consequently such farmers have not got separators.

3636. Not even for emergencies?—It is a very rare thing indeed I think.

3637. If it is a fair question, what is the price of milk per gallon at the farm?—It varies very much according to the time of the year, and the position in which the farm is, and the time at which it can be delivered to a town. There are many circumstances which come in to affect the price of milk.

3638. About how much per gallon would it be generally?—You see it depends upon various circumstances; for instance, if you have a place 200 miles away from London.

3639. I mean the price at the farm?—But the cost of conveyance to London varies, and consequently the price; it is always sold delivered to London or delivered to a large town, and then the price at the farm would be so much less by the extra carriage; but you may take it roughly that the price would be from 5*d.* to 6*d.* per imperial gallon in the summer at the farm, and in the winter from 8*d.* to 10*d.*, or from 8*d.* to 9*d.*, say. It depends so much upon where the farm is situated.

Mr. *Whiteley.*

3640. I have only one question to ask you. You say that margarine is coloured for the purposes of fraud?—Yes.

3641. I suppose you have seen coloured margarine exposed for sale in shops with the letters "margarine" upon the package?—Yes.

3642. Has the margarine been coloured for the purposes of fraud?—I am not speaking of any particular sample in any particular shop; I am speaking generally of the reason why it is churned, and why it is coloured, why it is not sold in the original colour in the same way as lard would be.

3643. Do not you think that it is rather to make it pleasing to the eye, just as people colour butter?—That may have something to do with it; but the reason why it is pleasing to the eye is because butter is of that particular colour.

3644. Still it is to make it pleasant to the eye, and of the colour which butter is?—Of the colour which butter is, undoubtedly. It opens the door to fraud, there is no doubt about it, very largely.

3645. You would prohibit the colouring, and force it to be sold absolutely white like lard?—I do not know what colour it is in its natural state. I would not have it coloured, so that it might be sold as butter.

3646. Have you any opinion upon the mixing of butter and margarine?—I would let the purchaser mix it for himself.

Mr. *Whiteley*—continued.

3647. Every man his own mixer?—That is so.

3648. Do not you think that it would be a very difficult task if you left a man to carry that out for himself?—I fancy that every man who wished to do it, could do it.

3649. As a matter of fact, is not most of the margarine sold mixed by machinery in a skilful manner?—I believe it is.

3650. Practically you would oblige everybody to make his own mixture in an unskilful manner, and possibly distastefully?—I would leave everyone who wished to mix it to mix it, in order that those who do not wish to have it might not have it unknowingly.

3651. Practically, would not the effect of the prohibition of colouring margarine be to raise the price of butter?—That does not affect me in a fractional way.

3652. But speaking as a man of the world, do not you think it would increase the price of butter?—The object of this Committee is to prevent adulteration and fraud, and it is not a question of price so much as it is a question of genuine article.

3653. I am told that margarine in its natural state is of the colour of cream, and that cream coloured butter is the most popular in Lancashire; do you know that?—Then I cannot conceive, if that is so, why gentlemen should wish to colour the margarine at all. I should think they would be at one with us at once, seeing that cream is such a popular colour, but I do not know what the natural colour of margarine is.

Mr. *Jeffreys.*

3654. I should like to ask you on that subject whether the result of the non-colourisation of margarine would be, not to raise the price of butter, but to diminish the price of margarine?—I would answer you in the same way that I answered the other honourable Member, namely, that I do not think it is a question for me whether it would increase the price, or diminish the price. The object is to prevent fraud, irrespective of what the price may be.

3655. I mean to say that if the fraud were stopped, then the margarine would sell at its natural price, which I believe is very much below that of butter?—Each thing would stand on its own basis, and its own level, whether it would be higher or lower.

3656. And I suppose that the colouring of margarine is merely in order to perpetrate a fraud and sell it as butter?—That is how it appears to me.

3657. One question about the low standard of milk from the cow. If a cow were so badly fed as to produce a very low standard of milk, would you then propose to punish the man who sold the milk, although that milk was a pure milk of very low standard?—If it could be shown that the cow was so badly fed, it would practically come under the head of cruelty to animals.

3658. No, not quite, if the cow were fed on grains and roots?—I see your point of view. I do not think you could punish the man if the milk were pure.

Mr. *Jeffreys*—continued.

3659. You would not be prepared to go so far as that?—Not if it could be shown that the milk was pure, and the cow properly nourished.

Mr. *Whiteley.*

3660. I suppose you know that everything but pure butter, that is to say, mixtures of butter and margarine, have to be sold as margarine, and labelled as such in the shops by law?—Yes, I believe that is so.

3661. Therefore it is only just the carrying out of the law with which fault can be found; not with the law itself. May I put it in another way: If the law were made effective, both mixtures and margarine would be sold as margarine if the law were carried out?—I suppose that would be so, but that is a very large "if."

3662. Your difficulty, I mean, is not with the law as it stands, but with the carrying out of the law; is not that so?—My point is that we should in every way facilitate the carrying out of the law, and if, by allowing the colouring of margarine, we make it almost impossible to carry out the law, then it would be far better to adopt a system by which the law could be easily carried out and the public get the article for what it is, and not for what it is not.

3663. But do not you think that the law is sufficiently strong and perfect at the present time for all those purposes, if the inspection were effective and if it were carried out?—I do not think it is; I think it is impossible to get it so.

Chairman.

3664. Then you would amend the law, I understand you to say, by making the colouring of margarine an offence?—I would.

3665. Would you increase the penalties under the law in any way?—I do not know what the penalties are, but experience shews that adulteration in dairy products is such a remunerative thing that it is impossible by fines to stop the practice.

3666. And you would substitute for fines, what?—I would have something much more stringent, where it could be clearly proved that the intention was fraud. Certainly, after the second conviction, I would have imprisonment. It seems to me a worse form of picking a man's pocket than putting your hand into his pocket and taking out his purse.

3667. I think you have something to say about the sealing of milk churns?—I know that, so far as the Great Western Railway Company is concerned, and also the London and South Western Railway Company, they allow the

Chairman—continued.

sealing of milk churns; in fact, I have one of the Great Western Railway Company's conditions here by which they carry it, and they say, "In the case of 'sealed' cans, instead of the inside of the can being marked, each can must have its 'tare' conspicuously stamped thereon outside," clearly showing that they allow sealed cans.

3668. You think that sealing is necessary for the protection of the farmers?—I think it is an additional protection, certainly. All my milk comes to London sealed; at least, all that I send to the Aylesbury Dairy Company.

3669. And, therefore, it cannot be tampered with on the way?—No.

3670. Do you think that tampering with milk on the way is at all common?—I think it is done.

3671. Occasionally?—Yes; not necessarily after it gets to the railway, but after it leaves the farm. I have known it done by farm servants when it is on the road to the station.

3672. And, as a protection from that, you think it is necessary that the cans should be sealed?—Yes, and I have known it done at railway stations before it has left.

3673. And you want the sealing to be universal on that account?—I thing it would be a very great advantage.

3674. Did I correctly understand you to say just now that one of the dangers of a low standard for milk, say three per cent. of fatty solids, was that it might lead some people to feed their cows in such a way as to produce a larger quantity of milk and so deteriorate the natural quality?—I should think it would be very bad judgment in any man doing that, because he not only deteriorates the quality of his milk, but deteriorates the quality and health of his cow; and I cannot conceive that he would do it; but it may be done. You put it to me that three per cent. is a low percentage. Three per cent. is low as compared with what I have sent; but I should hesitate to put the standard higher than three per cent.

3675. You think that with a standard of three per cent. any attempt on the part of the farmer to so feed his cows as to get the milk down to a standard of three per cent. would be bad policy on his part?—I think it would be extremely bad policy on on his part.

3676. Because it would deteriorate the quality of his cattle, and generally injure the value of his stock?—Yes.

3677. And in that way it would counteract the temptation of which you spoke?—I think so.

Mr. THOMAS CARRINGTON SMITH, called in; and Examined.

Chairman.

3678. I THINK you come from Admaston, near Rugeley, in Staffordshire?—Yes.

3679. And you are a farmer there?—Yes.

3680. Do you farm largely?—No, not largely. I keep about 50 dairy cows.

Chairman—continued.

3681. And about how many acres of land have you?—Under 300 acres.

3682. You are a Member of the Margarine Committee of the Central Chamber of Agriculture?—Yes.

3683. And

Chairman—continued.

3683. And you were Chairman of the Staffordshire Chamber of Agriculture?—Yes, for many years.

3684. And you are an Alderman of the County Council?—Yes.

3685. You generally support, do you not, the recommendations of the Margarine Committee of the Central Chamber of Agriculture?—Yes.

3686. And you think that the adulteration of farm produce should be treated in the same way as contagious diseases are treated as regards animals, namely, by inspection at the ports, and the stoppage of all adulterated goods?—Yes.

3687. You regard it as dangerous to the community that they should be allowed to come into the country?—Not precisely so, but in order to protect the honest dealers and to protect the public.

3688. Then you can hardly put it on the same level as the contagious diseases in animals, can you?—On the same level as regards inspection, but not for the same reasons.

3689–90. That is to say, you would have your inspections as accurate in this case as in the other, but for different reasons?—Yes; and I explain my reasons: In the County Council of Staffordshire we find it invidious to prosecute a retail dealer who sells adulterated goods when those adulterated goods have been imported from abroad, and we think that if the same steps were taken with respect to the importation of articles of food generally, which are taken with respect to the importation of tea, then the importation of adulterated goods would be checked at the port of entry. I am informed that such an inspection is obligatory in the case of tea, and that such inspection has checked the importation of adulterated tea; and I fail to see why the same protection for the honest producers and for the buyers should not be extended to other articles of food.

3691. How far would you extend it with regard to foreign produce; to what articles would you extend this principle of inspection at the ports of entry?—To all articles of food and drink.

3692. To everything produced on the farm?—To all imported articles of food and drink, not necessarily produced on the farm, because there are plenty of articles that farmers do not produce which are imported.

3693. You would stop them too?—I would subject them to inspection.

3694. Do you think that that would have any effect upon the food supply of the country?—Yes, it would; it would raise the value of the food imported.

3695. The feeding value do you mean?—Yes.

3696. You do not mean the price?—That I cannot tell; probably it would raise the price, because it would clear the ports considerably of articles that are sold under false denominations.

3697. That is to say, it would lessen the number of articles competing in the market, and so probably raise the price of those that did get into the market?—Possibly.

Chairman—continued.

3698. And that would be beneficial, you think, to the agricultural interest?—And to the consuming public.

3699. It would be beneficial to the consuming public on the ground of the purity of the article sold, and to the agricultural interest possibly on the ground of price?—Yes.

3700. You would have not only uniformity of practice at the ports with reference to this inspection, but you would have uniformity of administration, if possible, throughout the country?—So far as possible, for this reason: I have here in my hand a report of our county analyst and our county inspector, who state that one of their main difficulties in the administration of the Sale of Food and Drugs Act is that some neighbouring authorities allow the existing legislation to be inoperative.

3701. That is to say, that in certain districts the administration is comparatively imperfect, while in other districts it is more accurate?—We have found out by returns which the Central Chamber have got in, that certain local authorities never take any samples at all.

3702. And in spite of pressure from time to time put upon them by the Local Government Board?—That is so.

3703. You therefore would have some new legislation which would give powers to a central authority, possibly, to stir up these various local authorities to uniformity of practice?—To employ inspectors of their own, travelling inspectors.

3704. That would follow from the uniformity of practice?—Yes. There is an analogy there again with the Contagious Diseases Animals Act, although I can see that the analogy cannot be carried through, inasmuch as we have found that the administration of the Contagious Diseases Animals Act under the various local authorities was very inefficient, in some cases well carried out, and in others, badly carried out; and we have found a vast advantage in using the powers of a central authority, and in having centralisation.

3705. Is your experience as a member of a local authority in favour of much interference on the part of central authorities?—Yes, I must say regrettingly that I must admit that, because centralisation is contrary to my own first views; but, with respect to adulteration and to disease, I have found so great an advantage from centralisation that I am bound to say that we cannot get on without it.

3706. In spite of your prejudice or your judgment in favour of local administration, you are obliged to admit that central interference might be useful with regard to adulteration as it has been with regard to the Contagious Diseases Animals Act?—Yes; we have proved that it has been so in regard to contagious diseases, from the fact that in the area of a geographical county you have various conflicting authorities who act on various conflicting views.

3707. And the central authority is needed, in your opinion, to reduce them to uniformity of practice?—That is so.

3708. You think that margarine should be sold in its natural colour?—I do.

Chairman—continued.

3709. You do not wish to colour it in any way?—No, I do not. I think it would be invidious to ask the trade to colour margarine in an objectionable way. I am quite satisfied that it should be sold under its own colour.

3710. And, as an amendment to the law, you would have power to prevent its being coloured so as to imitate a highly-coloured butter?—I would.

3711. Do not you think that if margarine came in of a cream colour, it might still be a competitor in the market against butter of a light colour?—Possibly it might, but I have no experience as to that. I could not help hearing the question upon that subject put to the last witness, but I have no experience in the matter. I should have said that margarine was not the colour of rich cream, but that it was almost the colour of that paper (*holding up a piece of paper*).

3712. In the case of adulterated articles, have you anything to say about the warranty being used as a protection?—Yes; we find in the administration of the Sale of Food and Drugs Act in our county that the retail dealer very naturally falls back frequently upon the warranty, and the magistrates very naturally have an objection to fine a retail dealer heavily if that retail dealer has bought the article not knowing it to be adulterated. But we cannot get easily at the wholesale dealer; we do sometimes get at the wholesale dealer, and I may say that if we can, we do.

3713. So you want to make the wholesale dealer more accessible?—Yes.

3714. So that you can prosecute him when the retail dealer is unwittingly selling an adulterated article?—Yes. I may give you a case in point, which was decided in our own county, which will show the opinion of the stipendiary magistrate dealing with the two questions which you have just put to me. This is the stipendiary magistrate's opinion of margarine. At Wolverhampton this year, a retail dealer was prosecuted, and in the opinion of the stipendiary magistrate there was very little guilt brought home to the retail dealer, inasmuch as this margarine was delivered to the retail dealer as butter. The stipendiary magistrate, in giving his judgment, said this: "in fact the whole concoction of margarine is a fraud from beginning to end. It was coloured so as to resemble the natural product butter, because if it was not so coloured, people could not be deceived into purchasing it as butter. It helped the dishonest dealer who wished to cheat his customers, and it acted very prejudicially against the tradesman who wished to act honestly, but who was led into committing a fraud by the fraud committed upon himself by the wholesale dealers with whom he did business. He hoped that such cases as these would induce the Legislature of this country to follow the example set by certain places on the Continent, and pass a law to compel manufacturers of margarine to colour the article in such a way that it should not be mistaken for real butter." Then he ordered the defendant Lester, the wholesale dealer, to pay a penalty of 5*l.*, but he allowed the case against the defendant Bagley to be withdrawn on payment of costs, Bagley being the small retailer.

Sir *Mark Stewart.*

3715. Did the county council of Staffordshire support the suggestion of an international conference, as made by the Danish Government?—Yes, they did.

3716. Could you inform the Committee what their suggestions were?—Their suggestions were that there should be an international conference. Perhaps I may explain that in consequence of a communication which I received from Mr. Harald Faber, the Commissioner of the Danish Government, he came down to see me on the eve of the meeting of the county council of Staffordshire. I may say that, instead of the police taking over the management of the Sale of Food and Drugs Act, it is placed in the hands of the sanitary committee of the council, and the chairman of the sanitary committee, in conjunction with Mr. Faber and myself, drew up a resolution in favour of an international conference.

3717. The international conference being against all food adulterations, or only adulterated dairy produce?—The international conference was suggested in the House of Lords by the Duke of St. Albans, and in consequence of a representation made by the Danish Minister to Lord Rosebery.

3718. On dairy products?—On the importation of dairy products.

3719. It applied exclusively to dairy products, I presume?—It did.

3720. Have you anything further to say about the conference?—Yes; in consequence of that consultation between Mr. Faber and myself and the chairman of the sanitary committee, my council adopted unanimously this resolution: "That inasmuch as the Danish Government have suggested to the Government of this country the desirability of calling together an international conference to take steps against the international trade in adulterated butter, this Committee expresses its opinion that such conference is desirable, inasmuch as examination with international action would be an effective means of preventing the sale of adulterated butter."

3721. When did that take place; what is the date of it?—This resolution was passed on the 25th July 1893.

3722. And has it been acted upon in any way?—No. I may quote what took place in the House of Lords in connection with this point. The Duke of St. Albans having made this application to the Government, in accordance with that proposition, Lord Rosebery said that "his part in the matter was a very simple one, namely, to explain that a proposal of the kind referred to was made by the Danish Government, but owing to the doubts expressed by the Board of Agriculture, the Board of Trade, and the Local Government Board" (all three of which unfortunately have to do with these things) "Her Majesty's Government did not agree to it. Inasmuch as negotiations on the subject were still proceeding, it would not be right for him to lay the papers on the table. His noble friend Lord Ribblesdale would answer the question, as it affected the Board of Agriculture." I may state that nothing has occurred since.

3723. What

Sir *Mark Stewart*—continued.

3723. What was the date of that reply of Lord Rosebery's?—July 4th 1893.

3724. And nothing has occurred since?—Nothing has gone forward since.

3725. What is your opinion now upon this proposed international conference: Do you think that it would be a good thing?—It would be a good thing; but I do not see why this country should not take action itself, by inspection at the ports, and do its own business without reference to what other countries do.

3726. Has there been any complaint by the inspectors for North and South Staffordshire of the inactivity of neighbouring local authorities?—There has; we have inspectors both for North and South Staffordshire, that is to say, we divide the county into two districts which are worked by two separate inspectors, and both of those inspectors have repeatedly complained of the difficulty that they have in following up prosecutions where retail traders are convicted, in order to get at the wholesale dealers, because they live in the areas of other local authorities who will not exercise their powers under the Sale of Food and Drugs Act.

3727. Do those inspectors act under the chief constable's authority?—No, under the authority of the sanitary committee of the council.

Mr. *Jeffreys.*

3728. That is unusual, is it not?—It is unusual.

Sir *Mark Stewart.*

3729. Have you any opinion to express upon the advisability of their being under the county council?—Although our inspectors are exceedingly active, I must say that I am somewhat disappointed with respect to the progress that we are making in putting down adulteration; for this reason, that the inspectors and their assistants are so well known that it is most difficult for the inspectors to get samples. One of our inspectors regularly employs a woman to go into shops, and buy for the purpose of analysis, because he knows quite well, that if either he or his assistant goes into a shop, he will not be served in the same way as the purchasing public would be served. So I must say that I think we must revise our practice in the county council of Staffordshire, and extend our officials whom we empower to take samples.

3730. Then, is the inference from your answer to my question that it would be better to employ the chief constable of the police instead of the sanitary committee?—I am not quite prepared to go so far as that. We might use the police to a certain extent.

3731. How many samples do the inspectors take, do you suppose, in a year?—I came away from my county council yesterday, and I have here a quarterly report, if I may refer to the report of our county analyst, and to that of the inspectors. Under the article of "butter" the county analyst reports that he had 47 samples submitted to him for analysis, seven of which proved to be margarine.

3732. During the past 12 months?—This is the quarterly report.

Mr. *Jeffreys.*

3733. In the last quarter?—Yes; "Out of 47 samples analysed, seven proved to be margarine, containing from a trace up to 40 per cent. of real butter." Then he offers an opinion: "There seems to be a tendency to increase the percentage of butter fat in margarine, probably with a view of its more likely passing as the genuine article." Then, with respect to milk, the chief analyst reports that he has had 61 samples of milk, and I think he states that he had seven samples which induced him to institute a prosecution; and he says "One sample had been diluted to the extent of one-third, whilst another sample, besides having been watered to the amount of 22 per cent., had also been deprived of at least 40 per cent. of its cream." Then he gives an opinion on the question of separated milk: "Creaming or mixing with 'skim' milk is the more frequent direction that tampering with this article now takes, and seeing that analysts have to take a very low standard for this consideration, I have little doubt we pass over a very large number of somewhat skimmed samples."

3734. What is the standard there?—I have a letter from the chief analyst from which I gather that we really have no standard, that each analyst is a law unto himself, but our analyst lays down the general idea that 3 per cent. of butter fat is the least that we can ask for.

3735. And what of solids?—He does not say.

3736. You have nothing more to say on that point then?—I have, with respect to my own practice of milk, but not on the practice of the county council.

3737. You have already spoken about margarine; is there unanimity of opinion between the county analyst and the inspectors as to colouring margarine, so as to imitate butter?—Perfect unanimity.

3738. Do they ask that it may be made illegal to mix butter with margarine?—They do; that it should not be coloured to imitate butter.

3739. Can you speak as to retail traders being frequently deceived by the wholesale dealers and manufacturers in regard to purchases made of margarine for butter?—We have had several prosecutions, like the one I have already quoted before the stipendiary magistrate at Wolverhampton, pretty much on the same lines, and we have been successful in several cases in getting at the wholesale dealer.

3740. And what sort of penalties have been imposed?—The magistrates in my county are increasing the penalties. If they can get hold of the wholesale dealer they impose a very heavy penalty.

3741. What do you call a heavy penalty?—£20

3742. That has been imposed, has it?—Yes.

3743. Do you think that the effect of such a fine is sufficiently deterrent, without going further?—No, because the profits on the manufacture of margarine are so great that 20*l.* is a small penalty to a large wholesale manufacturer.

3744. What would you put the fine at in order to have a deterrent effect?—It is very hard

Mr. *Jeffreys*—continued.

to say; it depends upon the business of the man who is fined.

3745. Would you imprison him?—I would after a second conviction. I do not think I would after a first conviction.

3746. Can you give any illustration of prosecutions for selling as butter a mixture containing between 80 and 90 per cent. of foreign fat?—Yes, I can; in the neighbouring county of Leicestershire, not in my own district with respect to what I am now saying; but I can in my own district also. In the neighbouring county of Leicestershire a certain shopkeeper was summoned for selling a mixture as pure butter, and he fell back upon the warranty, because he had a written contract with a certain person living in the county for so many pounds of butter per week. The analyst's certificate gave from 80 to 90 per cent. of foreign fat, and the local magistrates fined, but fined quite nominally, in as much as the retail dealer convinced them that he had bought this so-called butter unwittingly, and he gave the name of the person from whom he had bought it. On inquiry it was found that the person who had made the contract to supply the shopkeeper with so much butter did not keep a cow at all.

3747. What was the result; was the shopkeeper fined?—The shopkeeper was fined nominally, but the man who supplied him went away, and they could not get at him.

Mr. *Yerburgh.*

3748. Why could they not get at the original offender?—He was gone, he neither kept cows nor had he a manufactory; he had handled the material with which he had dealt.

3749. He was a middle man, was he?—He was an adventurer, who had bought his stuff from no body knows where, and mixed it up and gone away.

Sir *Mark Stewart.*

3750. Containing 80 or 90 per cent. of foreign fat?—Yes. I can give you another case at Leek, which has been dealt with in my own county under the prosecution of our own inspector, Mr. Knight. A certain farmer in the neighbourhood of Leek kept three cows; he and his daughter attended the local markets at Leek and in the neighbourhood, with their baskets, and sold butter in the public markets to a very considerable extent. Suspicion was aroused, and a sample was taken in the ordinary market, not in the shop, and it was found on analysis that there was a very large proportion of foreign fat in this butter sold out of the baskets. On prosecuting the enquiry it was found that this farmer bought a hundredweight of margarine per week, took it home, and mixed it up without the help of any apparatus.

3751. And sold the butter as home made butter?—Sold it all as home made butter.

3752. What was the result of that prosecution?—The result of that prosecution was fines to the extent of 38*l.*

3753. On the farmer?—The farmer and his daughter were fined to the extent of 38*l.*

Mr. *Channing.*

3754. Was that a substantial fine for people in their position?—Yes; I think that stamped it out; locally, I mean.

Sir *Mark Stewart.*

3755. Is it your opinion, then, that no amount of inspection can do much good so long as a colourable imitation of butter is permitted as a butter substitute?—That is my opinion. That was a case in point.

Mr. *Whiteley.*

3756. Was the margarine that the farmer bought coloured or not?—That I do not know, but I should say that it was, or else it could not have been sold as butter.

3757. Supposing you were to mix colourless margarine with higher coloured butter, the average would be practically the colour of ordinary butter, would it not?—That might be so.

3758. So that really your prohibition of the colouring of margarine would be non-effective in that case?—I take it that it would not be so. In this case there was from 80 to 90 per cent. of foreign fat. If the man had been dealing with cream of Channel Island cows, he would have had a very highly coloured butter, but quite insufficient to have coloured the whole mass of uncoloured margarine, with 80 per cent. of foreign fat.

Sir *Mark Stewart.*

3759. Could the farmer have blended the two mixtures of pure butter and coloured margarine without machinery?—He did it; I do not know how he did it.

3760. Do you consider that there should be any fixed standard for milk?—I do.

3761. What standard would you propose?—I would put in evidence my own contract with the London firm here, which is the same as that of the last witness, and I would say also that although I have not been furnished with the analysis of the milk by the firm who buy my milk, my own analysis taken at my own expense shows that I have no difficulty in supplying milk up to the standard which I contract to do. My contract with the London firm here is that "milk yielding less than 3¼ per cent. of fat and 8¾ per cent. of solids not fat, is to be regarded as not complying with the term 'perfectly pure.'"

3762. That is 3·25 per cent. of fat and 8·75 per cent. of solids not fat?—Yes, I agree to supply it perfectly pure.

3763. Would you propose to make the standard as high as 3·25 per cent. as the fixed standard for the whole country?—No; I dare not. I am not prepared to go further than 3 per cent., with an appeal to the cows, to the whole herd of cows, not to a single cow. I may say that I regret that I have not applied to this firm for the analysis of my milk during the last year, because I take great interest in the influence of food on milk. They told me personally that they could not do it, that it was not their practice; but I gathered that the last witness had prevailed upon his firm to give him the analysis of his milk when it went in. But there has never been any complaint of my milk,

and

Sir *Mark Stewart*—continued.

and I have no doubt that my milk all through has been always above the minimum of my contract. The whole quantity of milk is put together, and, for my own satisfaction, I have a sample taken from the whole bulk of one milking—always the morning's milking—with respect to the analysis that I am going to give.

3764. That is not the milk of the night previous, but the milk that is milked in the morning. What do you call the morning milk?—The analyses that I am just going to put in were taken from samples of the morning's yield, that is to say, of the whole produce of 50 cows, after being milked at one morning's milking. On the 30th of April last I brought up a sample with me to London (entirely for my own satisfaction), and I left it with an analyst in Chancery-lane. You will remember the first flush of grass in May; and I agree with the last witness, that that is when we get the lowest quality of fat in milk. The analyst gives me here 3·4 per cent. of fat. and 10·1 per cent. of solids. I was feeding my cows very richly at that time.

Mr. *Channing.*

3765. Is that 10·1 per cent. of total solids?—No, solids not fat; making a total of 13·5 per cent. Six weeks afterwards I was coming up to the Farmers' Club to hear a paper by Dr. Voelcker on feeding experiments in Woburn, and, for the purpose of the Farmers Club discussion, I thought I would get the evidence of my own milk as yielded that particular morning, the 5th of June last. I may explain that some days previously to that date I had purposely ceased giving my cows any cake, and was only giving them bran and maize meal, and rice meal—foods not very rich in fat. I brought it to the same analyst, and on June the 5th he gives me instead of 13·5 per cent. of total solids 13·35 per cent., that is to say, 13⅓, as near as may be, instead of 13½; and of solids, not fat, he gives me 10·05 per cent., and of fat 3·30 per cent., making a total very nearly approaching the analysis of six weeks before, but instead of showing 3·40 per cent. of fat, I get 3·30 per cent. of fat.

Sir *Mark Stewart.*

3766. What were you feeding your cows on at the time?—I entirely attribute it to the difference in the food that was given for the time being. Whereas at the end of April I was using both linseed cake and decorticated cotton cake, in addition to maize meal and rice meal, on the 5th of June I was only using meals without the cakes.

Mr. *Channing.*

3767. Can you gave the quantities per cow of cake used in April?—Only approximately; I could not give it better. In April, I would say, that I was using 2 lbs. of the two cakes, and about 3 lbs. of cake and middlings, what you call white middlings.

Sir *Mark Stewart.*

3768. What cows are yours?—Dairy shorthorns; not pedigreed.

3769. Have you anything further to say on that point?—Excepting that although I agree to furnish milk giving, as I put it here, 3·25 per cent. of fat, and 8·75 per cent. of solids not fat, I think it would be dangerous to ask for a standard as high as that.

3770. Have you any suggestion to make on the question of skimmed milk; do you think that skimmed milk ought to be labelled or marked in any particular way?—I do. I may say that I have formed a very strong opinion in consequence of a decision of, I think, the late Lord Chief Justice, who held that a small label on a tin in which condensed milk was sold, with the words "skimmed" so small that the buyer did not notice it until after he had got away, was a sufficient protection to the seller; that is to say, that the epithet "skimmed" was so placed upon the condensed milk tin that it was overlooked, while the word "milk" was read easily. I would ask for the word "skimmed" to be larger than the word "milk" in all cases.

3771. Where ought the onus of proof that the purchaser was fully informed of what he was buying before payment to be: on whose shoulders ought it to be placed?—It should be put upon the defendant.

3772. That is to say, that the onus of proof that the purchaser was fully informed of what he was buying before payment should be thrown upon the defendant?—That is to say, supposing that a person is prosecuted for selling an article under false pretences, he must prove that any label that he had was pointed out to the purchaser before payment was made for the article purchased; the onus of proof must be put upon him.

Mr. *Whiteley.*

3773. But if the label has distinctly stated upon it the quality of the article, would you still put the onus of proof upon the vendor?—In the case to which I alluded, the defendant did not prove that the small word "skimmed" was pointed out to the purchaser before payment.

3774. That was the case before the late Lord Chief Justice?—Yes.

Sir *Mark Stewart.*

3775. What was the case called?—The Condensed Milk case.

Mr. *Whiteley.*

3776. This (*producing a label*) is the identical label. I venture to say that you can almost see from where you sit that it has "skimmed milk" upon it?—Is that the identical label in the case?

3777. So I am informed?—May I see it for one moment. (*The label was handed to the Witness*). My recollection of the case was that the purchaser swore that the word "skimmed" was not noticed by him when he paid for the tin of condensed milk.

3778 But supposing that it was noticeable and sufficiently large, then the onus of proof would not fall upon the vendor, would it?—No, I think that would be sufficient proof if the buyer could not buy the article without seeing it.

Mr. *Whiteley*—continued.

3779. The late Lord Chief Justice said "I do not follow the finding of the magistrate, because, here, as plain as a pikestaff, is written "skimmed milk." That is the ruling?—That is so.

Mr. *Channing.*

3780. But it is the fact that the letters of the word "skimmed" are exceedingly small and thin, is it not?—Very thin. I was a long while before I found it.

Mr. *Whiteley.*

3781. Yet, in the opinion of the late Lord Chief Justice, it was as plain as a pikestaff?—*De mortuis nil nisi bonum.* I should say that it is not so.

Sir *Mark Stewart.*

3782. Would you alter the position of the word "skimmed" on that label to where the calf is?—Neither of those words are prominent to the purchaser. The thing that is prominent is the milk on which the calf is fed; that is quite sufficient, I think, to deceive a customer.

3783. Does the county analyst of Staffordshire make a strong point that there ought to be a fixed standard for milk?—The county analyst writes to me to the effect that he is very strongly in favour of a fixed standard, and he goes on to express the view that he thinks all analysts are of that opinion, which I did not know. He is of the same opinion as myself, that no honest supplyer of milk could take any harm if the standard was fixed at 3 per cent.

3784. Would you be inclined to favour the adoption of greater publicity by publishing the particulars of the analyses in the papers?—I would. It appears to me that the practice now in the police courts is not to give sufficient prominence to the standard upon which the particular analyst goes, because each analyst may choose his own standard. In my judgment, seeing that there is so much adulteration, I ask for each analyst who is called in the prosecution to give the standard upon which he himself works; I ask also that he shall give the result of the analysis of the incriminated milk.

3785. And you ask that they should be published, so that the public should know what they are?—Yes. I went so far as to write to the Home Secretary and the President of the Local Government Board about it, but they did not see the necessity for doing it.

3786. Do you consider that there ought to be a fixed standard for water in butter?—I have not a very strong opinion about that; but I wish to call attention to the fact that a prosecution in the neighbouring county to my own, the other day, was successful. The defendant pleaded that in Manchester the magistrates did not convict; but in this case at Ilkeston the magistrates did not accept the Manchester decision as effective, and they convicted, because there was 21 per cent. of water in the butter.

3787. What percentage do you consider that there ought to be?—I have not sufficient knowledge to say; I really do not know. I may say that both with respect to fixing a standard for milk, and with respect to fixing a standard for butter, I do not think that at present we have arrived at anything further than the desirability of such a standard being fixed, and that at present we must be satisfied with further inquiry with respect to fixing what those particular standards may be.

Sir *Mark Stewart*—continued.

3788. But still you have a clear idea of what you think it ought to be for milk; not below 3 per cent.?—Yes; but I must say that a great quantity of evidence has come to me to tell me that 3 per cent. is a very low standard.

3789. Your own milk being 3·25 per cent.?—It has never been so low as that; my contract being never to supply under that standard; my milk has never been so low as that by a good deal, so far as I know.

3790. Just one more question in regard to what you have already said about the prevention of fraud. Your principal contention is that by inspection all bad food ought to be stopped at the port of delivery?—Yes; I might add to that that it is a common conception that the Margarine Act provides for inspection at the ports of entry. I find, according to my own reading of the Act, that it only provides for the inspection of margarine; it does not provide at all for the inspection of butter.

3791. No, it does not?—So that it is absolutely useless, so long as the consignment is made under the name of butter, and practically it is not obligatory with respect to margarine.

3792. So that in any remodelling of that Act it ought to be more comprehensive, so as to include butter, and in fact all substances that could come under food adulteration?—That is so.

Mr. *Channing.*

3793. You say that a minimum of 3 per cent. is what you would suggest as the standard of fat?—Yes.

3794. Do you suggest also a standard of solids, not fat?—I have not sufficient knowledge of the subject to be able to give an opinion worth anything in chemistry, but I am struck with the fact that my own solids are very much higher than those which I have contracted to supply.

3795. Is it the case that some very rich milks, where the fat is rather in excess of 3 or 4, or perhaps even 5 per cent., will have non-fatty solids below a standard, say, of 8·5 per cent., supposing that to be taken as has been represented to us by other witnesses?—I may allude to a case of prosecution which took place at Clerkenwell here last year during the drought. This knowledge came to me both by reports in the newspapers, and by information furnished to me afterwards by the analysts. A certain farmer was prosecuted for having added water to his milk. He denied that he had done so, and appealed to the cow, and had a chemist employed to make another analysis. The analysis of the friendly chemist agreed with the analysis of the prosecuting chemist, which said that water was added. The farmer said that he never adulterated the milk, and asked the friendly analyst to go down and see all his cows milked, and all the milk mixed together, and then to take a sample himself from the mixed milk of the cows.

That

Mr. *Channing*—continued.

That analysis still gave the same result, the result being very low indeed in non-fatty solids. The information came to me; I got to know this from the analysts, that there was a very large proportion of fat in that incriminated milk, very much higher than I am now speaking of here, nearer 4 per cent. than 3 per cent., although it was particularly low in solids. I never could understand why the man was prosecuted. There arises my point, that the result of the analysis of the incriminated milk should always be given in open court, as well as the standard upon which the prosecuting analyst goes.

3796. In your opinion that case would rather go to show that it is inadvisable to attempt to fix a standard of non-fatty solids?—Yes, it would, because I hold, as our language expresses it, that the cream gives you the value of the milk itself.

3797. You think that the fatty solids are the measure of the value of the milk?—Yes, the cream of the whole thing.

3798. About this test of appealing to the cow, does not that involve very careful sampling?—In case a man was convicted of having adulterated his milk, and asked for an appeal to his herd, which I think ought to be given, then upon him would rest the onus of taking the sample from the whole of one milking's produce of his cows; but the farmer by whom the consignment was made, if his appeal to the herd showed that he had supplied milk as it was given by the cows, would have branded his own produce as being of very small value in the market, and he would have advertised himself as the seller of a very low article, although he would have escaped a fine for fraud.

3799. Do you think that would be practicable to employ that test in the case of a whole herd, say of 50 cows like your own?—Yes, there is no difficulty about it, just as the farmer did here. It is only in the case of an appeal.

3800. But how would you manage such testing; would you strip the cow and take the whole milk, or take a sample of the milking of each cow?—The whole mixed milk of the whole of the cows cleanly milked. I can give a case in point which again occurred at Leek, and of which I have the shorthand reporter's note here. A fortnight ago a farmer was summoned for selling milk from which cream had been abstracted according to the analysis. It came out in the defence that this milk was the real produce of the cow, but got in this way: that the farmer half milked his cows, that half being sold, and the other retained at home for the purpose of butter. The magistrate's clerk advised the magistrates that that was not abstraction. Our inspector, Mr. Knight, who is himself a lawyer, held that it was, and his opinion made the magistrates reserve their decision for a fortnight; and they gave their judgment at the end of the fortnight, in which they held that the half milking of a cow was in their view abstraction of the cream; and they convicted.

3801. That illustrates another point; it is hardly the point that I wanted to ask you. Supposing that in one milking of the cow you take the quart that first comes from the cow, that will

Mr. *Channing*—continued.

give you a less percentage of fat than the last quart, will it not?—There would be scarcely any fat at all in the first quart.

3802. That is the ground of the question I asked you as to this appeal to the cow, whether it would be possible to have an appeal to the cow unless you had very strict rules of sampling, and milking under the eye of the inspector?—Not necessarily. Why not get a witness as we do under other legislation, who will depose that he has seen the whole of the cows milked, and that a fair sample has been taken of the whole produce, and send it under seal to the analyst.

3803. Now about feeding; are those the only experiments of feeding, and the results of feeding that you have made which you have quoted just now?—They are, so far as analysis is concerned; but my own practice tells me, as plainly as anything can tell me, that the influence of food upon cows has a very great effect, not only upon the quantity, which is great, but also upon the quality of milk.

3804. Do you think that the choice of food has any power in determining the chemical composition of milk, that is to say, that if you give more fatty foods you get more fat in the milk?—I certainly think so. It is difficult to prove it. In point of fact I asked the Woburn people to institute experiments down at Woburn, and Dr. Voelcker tells me that it is nearly impracticable. I have it in his handwriting here, that you require at least 25 cows in each lot under feeding experiments continued for a long time in order to give any practical results of feeding experiments.

3805. Is it your opinion that the feeding of cows has such an immediately large effect upon the proportions of the fat that it would prevent the fairness of working a standard?—No, I think not.

3806. Could a man feed up his cows for a few weeks and artificially raise his standard, in order to advertise himself; and if we took that as the standard for the whole country should we be inflicting great injustice upon others? - Does your question point to the appeal to the cow; whether it would be possible for a man to alter the constituents of his milk during the time that the appeal was held?

3807. The appeal would be only one element. In case of any analysis arriving at the constituents of the milk, the question is whether the food affects the milk so rapidly and largely that the standard is illusory; if one man, by feeding highly naturally produces a high standard of milk, and another man who is compelled from circumstances to feed in a less satisfactory way, produces milk which would be proportionately lower?—I do not think that the effect of a change of food would be operative very quickly. You require an alteration in the cow herself under the influence of that food, which I think would not come (this I cannot prove) within a few days. The state of health of the cow, and her general production of flesh under a nitrogenous food, would be continuous under continuous good feeding, and it would not

Mr. *Channing*—continued.

answer to a change of food in the course of a few days.

3808. You do not think that it would have such an excessive effect that it would make a standard impracticable to work?—I think not, so long as that standard was not fixed rigidly high.

3809. You think that 3 per cent. of fat with an appeal to the cow, that is to say, allowing a small man to prove that he was not adulterating by an appeal to the cow, would sufficiently cover all cases?—I think that there is absolutely no risk to honest producers of milk with a standard so low as 3 per cent.

3810. I do not know whether you can throw any light on the milk-testing trials of the Dairy Farmers' Shows; do you attach any importance to the very high figures that they have arrived at in those shows?—Not very much.

3811. Do you think that the cows may have been forced in those cases?—I freely grant that the natural capacity of cows varies very greatly, quite irrespective of their food, and that a skilled farmer with the help of skilled chemists may get individual cows that are immensely superior to the ordinary run of cows. That, I take it, is how it is that the show cows show such an abnormal quantity of fat.

3812. And those very high and exceptional figures do not shake your opinion that the average cow would produce under fair circumstances at least 3 per cent. of fat?—I have not the least doubt of it myself, speaking of a number of cows together. How it would be with a person who kept one or two cows, I cannot tell, the average would be so little influenced by the mixture.

Sir *Mark Stewart.*

3813. Of course there are different families in the cow tribe, some of which yield very much richer milk than others?—That is so; in all that I have said I have entirely excluded from my mind the Channel Island cows.

3814. Have you had any experience of Ayrshire cows?—I have not.

Mr. *Yerburgh.*

3815. Upon the question of giving power to the inspectors of Her Majesty's Customs to take samples at the ports, I understood you to say that you would extend that power to all food products, and would not confine it to butter only?—Certainly.

3816. You were asked your opinion as to what effect that would have upon the price of these food products, and I understood you to say that one effect in your opinion would be to increase their value as food to the consumer?—That is so.

3817. And you were further asked as to whether in your opinion it would increase their price to the consumer. I want to ask you a question upon that. We have had since 1876 the power in the hands of the Customs to take samples of tea, and I think we have been told by previous witnesses that the adulteration of tea is practically stopped. I would like to ask you whether since that power was given by Section

Mr. *Yerburgh*—continued.

30, I think, of the Act of 1875, the price of tea has increased?—It has decreased for this among several other reasons, that the duty has been lower.

3818. But apart from that, it has decreased in price you say?—Yes; and I think it was natural to expect that it would, inasmuch as the honest trade in tea would be encouraged by this check at the ports, and consequently the agriculture of tea would be spread; and we find that it has been so, Ceylon, for instance, produces tea very largely.

3819. Therefore what I understand is this: that generally you advocate this power being given to the Customs because you think it would be an advantage to the consumers as a body in this country?—Yes.

3820. That they would get a pure article?—Yes, and I honestly say also that I think it would offer an encouragement to the honest producers of agricultural goods both here and abroad.

3821. Then upon the question of the administration of the Act, I want to ask you as to whether you think that it would be an advantage if a central authority as now existing, say the Board of Trade, had the power to send down their own inspectors to take samples; do you think that that would be an advisable thing?—That is recommended in our report of the Margarine Committee of the Central Chamber of Agriculture.

3822. I do not think you were asked the question?—I think not. I entirely agree with that recommendation.

3823. We have had before us a recommendation made by Professor Long that the analytical work now done at Somerset House should be done by the Board of Trade, or possibly by the Board of Agriculture; do you think that that would be an advisable change?—I should like it to be more the business of some special department, and I think it looks natural to expect that that department should be based on the Board of Agriculture; but I really do not know sufficient about it to say.

3824. Sooner than have the present arrangement, you would advise that there should be some separate department to deal with this question of dairy produce?—At present it seems to be nobody's business. You appeal to the Board of Trade, and get referred to another body, and then you appeal to that other body and get referred back again to the Board of Trade.

3825. Do you think it advisable to charge a low scale of fees so as to encourage the public to send up samples for analysis, apart from the inspectors, supposing that you had such a body constituted?—They can do that now.

3826. But we have been told by a previous witness that that power is not very largely taken advantage of?—My experience tells me that few people like to place themselves in the position of public prosecutors.

3827. I know we have been told that that power is not taken advantage of, possibly for that reason, but we have also been told that one of the difficulties of obtaining samples is that the

inspectors

Mr. *Yerburgh*—continued.

inspectors are known, and that, therefore, probably they are given the pure article when they go to obtain samples?—Yes, that is so, I believe.

3828. While the public are served with articles in ordinary commerce, and therefore there is more probability that they would get the adulterated article than the inspector would?—I have no doubt that if the person who chose to become a public prosecutor, and took a sample, was freed from any pecuniary liability as to expense, there would be individuals found who would be ready to take upon themselves the office of giving information, and that the reduction of the fee (I don't suppose that you could do without some fee) would be a means, possibly, of inducing individuals to put the law into action.

3829. As to the case that you gave us of the adventurer who supplied a retail dealer with a mixture, how would you propose to deal with the case of people carrying on such a system of fraud?—That question would be met by my previous answer. I would prohibit the colouring of margarine at all.

3830. On the question of the colouring of margarine, you were asked whether, if margarine was uncoloured, if you prohibited the colouring of margarine and yet allowed it to be mixed with high-coloured butter, you would still be unable to prevent the fraud. I think it was my honourable friend Mr. Whiteley who asked you the question?—The honourable Member did not ask me whether I would allow of the mixture.

3831. What the honourable Member put to you was this: that if you prohibited the colouring of margarine, and that uncoloured margarine was mixed with highly-coloured butter, the result would be a margarine in colour resembling ordinary butter?—It would be so.

3832. But supposing that you further prohibited the admixture of butter with margarine, would you not then prevent any such fraud?—That is my opinion.

3833. Therefore I understand you to advise that both should go hand-in-hand, that you should prohibit the colouring of margarine, and also prohibit the mixture of any butter with margarine?—That is so.

3834. We have had it put to witnesses before whether margarine in its present condition, and under its present circumstances, was not largely used by private individuals and by institutions, and we have been told that there exists a practice in Copenhagen of margarine being sold uncoloured and unmixed to the buyers, and butter also being sold, and of those purchasers taking the articles home and mixing them for himself. I want to ask you a question upon that. In the case which you gave us of the farmer who was convicted of selling adulterated butter, I think you said it was discovered that he had been in the habit of mixing margarine with his butter at home?—It was discovered that he had been in the habit of buying a hundredweight of margarine a week, and selling large quantities of butter, although he only kept three cows. There seems to have been no evidence of his mixing it.

Mr. *Yerburgh*—continued.

3835. What aroused the suspicion as to there being a mixture of margarine with the butter?—I think some neighbours had remarked the peculiarity of the man selling so much butter and keeping so few cows, and they called the attention of the inspector to the fact.

3836. It was not the taste of the mixture or the appearance of it?—I have no definite knowledge, but I think that the first suggestion which I made was the correct one.

3837. Therefore we may take it that, so far as you know, this farmer was able in his own place to make a mixture which he sold in the country places as new butter?—He had succeeded in inducing the public to buy it out of his baskets in various public markets.

3838. So far as you know, he had no machinery?—So far as I know; he might have had a small separator.

3839. There is one other point that I want to put to you; at present under the present Margarine Act the packages in which margarine has to be sold, have to be lettered?—Yes.

3840. And it is suggested that the size of the letters should be increased; I take it that the object of the lettering is to enable the buyer to know what article he is buying?—That is so.

3841. For no other reason, I take it, is that clause in the Act?—That is so.

3842. I ask you whether in your opinion the buyer would not be more effectively protected if it was laid down that the packages in which margarine was sold, and the vessels in which it was delivered, should be coloured, say red; would it not be easier for any uneducated person or child purchasing margarine to know whether it was margarine or not if it had to be sold in packages coloured red?—It would, but I am not sure that it would not be invidious to the margarine sellers.

3843. Is it not the fact, from your experience, that there are certain articles of food now which the producers sell in certain coloured wrappers for their own purposes; their articles are good, and they wish the public to know it?—That is so.

3844. Can you give us any particular article that is sold in any particular coloured wrapper?—I think soaps are; I think so, I am not certain.

Mr. *Whiteley.*

3845. Is it not only poisonous drugs that are so sold?—I have no knowledge of that; what I meant was that I quite understand that for the purpose of advertisement the sellers of any article might use a prominent wrapper; but I take it that the seller of margarine would never think of doing so, from the fact that he is selling something which he would not so easily sell as something else.

Mr. *Yerburgh.*

3846. Then upon the question of the label that we had just now in the condensed milk case, I did not quite understand what the ruling of the judge was in that case?—The judge, the late Lord Chief Justice, held that the public was protected by the label very much, as the label said that it was skimmed milk; it is called in the trade "protection by label."

Mr. *Yerburgh*—continued.

3847. Then, taking your view as a member of the community, do you think that you would be better protected in purchasing condensed milk which was made from skimmed milk if everything else were prohibited upon the label but the words "condensed skimmed milk"?—I think we cannot prohibit the sale of skimmed milk, or condensed skimmed milk; but the words "skimmed" should be made so prominent that it would be totally impossible for a buyer to buy either milk in the can in the streets, or the condensed article, without seeing clear before him the word "skimmed" in very prominent letters. I hold that the word "skimmed" on that particular label is not prominent.

3848. What I want to ask you upon that point is this: do you think that the purveyors of this condensed skimmed milk would be damnified at all if, under the law, they were only permitted to put upon their tins "condensed skimmed milk"?—Without anything else?

3849. Yes?—With the word "skimmed" much larger than the word "milk"?

3850. Precisely?—Yes; I think there would be no odium in that.

3851. You do not think that that could in any way injure the trade?—I think not; the legitimate trade.

Mr. *Colman.*

3852. You have told us something about some of these precautions for margarine, and that you had got at the wholesale dealers, I think you said?—There was one case at Tamworth, where we got at the man in Birmingham.

3853. Is that the only case?—I think not; I think we have had two or three, but I am not able to tell you where.

3854. In that case, do you say that the invoice described the article as butter?—Yes. The defendant who was prosecuted was able to prove that he was an innocent seller of the margarine, because he had bought it for what it was not.

3855. He had purchased it as butter, and it was invoiced to him as butter?—Yes.

3856. And then he was let off?—With a small fine.

3857. He was fined?—Yes, with a small fine.

3858. What was done as to the wholesale dealer?—In one case he was fined 20*l.*, but it is very difficult to get at him.

3859. Do you know whether the retailer who sold it, sold it with a label in any way, or did he sell it simply under a verbal statement?—He sold it as butter.

3860. Did he sell it with a label on it or simply under a verbal statement?—I take it that there would be no label if he sold it as butter. That I do not know, but I take it that there would be no label.

Mr. *Whiteley.*

3861. You say that you are in favour of the inspection of all food stuffs at the port of entry?—Yes.

3862. Have you made any estimate of what the cost of the inspection of all food stuffs would come to?—No; in saying all food stuffs perhaps I went a little too far; but I take it that the check should be so great that it would imply that the importations of all foods went under the same examination as the importation of tea. I do not know that every packet of tea is sampled

Mr. *Whiteley*—continued.

3863. Could you tell by inspection what the component parts of a cargo of butter, or so-called butter, were?—Certainly not.

3864. You would have to resort to analysis?—Yes.

3865. And I suppose that the analysis routine is rather a lengthy one?—That is so.

3866. Taking from 36 to 48 hours?—That I do not know.

3867. Is butter like port wine; improved by keeping?—I can get an analysis of milk in six hours.

3868. But the analysis of butter, I think we were told took 36 hours?—I do not know.

3869. At any rate during the time that the analysis was being made, the butter, or so-called butter, would have to lie by?—Yes, the whole consignment would have to lie by.

3870. I suppose that you would not call it adulterated butter if it were imported for sale as margarine?—No, especially if it was uncoloured.

3871. Are you aware that since January 1893 the Customs have, from information received, only received one parcel of butter at the port of entry which was found to be adulterated?—I was not aware of that. Under what section did they take the sample?

3872. I suppose they took it under the Margarine Act?—No, they cannot.

3873. You say that in certain districts the existing legislation is inoperative, I think?—Because of the inactivity of the local authorities.

3874. Because of the supineness of the local authority?—Yes.

3875. But where the local authorities are active, you think that the existing legislation is sufficient to check adulteration?—My inspector says that no amount of inspection can put it down. These are his words; "no amount of inspection can effect very much good, as the inspectors are known, and strange customers looked upon with suspicion." That is applicable to margarine.

3876. Your complaint is against the local authorities, I suppose?—One of my complaints; but here an active officer of an active local authority says that his inspection is not very efficient, inasmuch as he is always looked upon with suspicion when he takes samples; and he goes on to say that if margarine was not sold under a colourable imitation of butter, that difficulty would be done away with.

3877. I suppose that the inspector can get samples taken by other people?—Yes; this man employs a woman.

3878. Therefore he is not in any way tied or bound as to the manner in which he obtains samples?—Except by the matter of expense.

3879. Then I suppose it is the question of expense that deters the local authorities from putting in force these Acts?—And the interest of some of the local authorities.

3880. I suppose that the local authorities represent

Mr. *Whiteley*—continued.

represent the people; they are practically the people in the various districts?—Yes, they are.

3881. Therefore you argue that if the people are not willing to spend money to protect themselves for their own interests against adulteration, they ought to be forced to do so in the interests of the farmers and agriculturists of this kingdom?—In the interests of public honesty, in the interests of the consumer as well as of the farmer.

3882. If they are not willing to do it for their own sakes, they ought to be obliged to it for the sake of somebody else, you think?—As a farmer, and as an administrator of the Contagious Diseases (Animals) Act, I have to find fault with farmers themselves, because they are so supine in carrying out their powers under that Act.

3883. Now as to the question of skimmed milk; I see upon this label that the words "skimmed milk" are at least a quarter of an inch large?—They are very narrow and thin.

3884. Notwithstanding that in the remarks of the late Lord Chief Justice, he calls them as plain as a pikestaff; these are his words. He says: "Here, as plain as a pikestaff, is written 'Skimmed Milk,' and the magistrates say that the conversation with the shopman did not convey to the inspector, nor did he in fact know, that the article was skimmed. If he did not choose to read it, how could the conversation alter it?"—I am aware of that.

3885. And the Lord Chief Justice adds: "The provisions of this Act are, very rightly, very stringent, because it is for the interest of the public that these drugs, and milk, and so on, should be sold pure." I suppose skimmed milk you look upon as a valuable article of food?—I do not.

3886. Then you disagree with former witnesses who have said that it was highly nutritious, and good for bone and tissue?—Did any farmer say so?

3887. No, an analyst said so?—My experience as a feeder of pigs and calves is, that it is a very dangerous food to use.

3888. I suppose that skimmed milk retains all the nitrogenous properties of milk?—It would

Mr. *Whiteley*—continued.

kill young animals, from babies to calves and young pigs, unless fat, in substitution of milk-fat, is supplied after the cream is taken away.

3889. As a matter of fact, are not tins of skimmed milk sold at a much less price in shops than pure cream milk?—I have no knowledge; I should never use the condensed skimmed milk myself.

3890. Has the price of butter decreased, in your opinion, since margarine was largely used?—It has decreased, and I think in consequence of the large quantity of margarine, but it is only right to say that there is a decrease in all articles of produce.

3891. Then you attribute in some measure the decrease in the price of butter to the consumption of margarine?—I do, and I am fortified in my opinion by my friend Mr. Faber, the representative of the Danish Government.

3892. Have you noticed that the importation of butter has increased about 50 per cent during the last few years?—I have not noticed it. I knew that it had increased largely, but I did not know to that extent.

3893. Might you not possibly attribute the fall in the price of butter more to the increase in the importation of butter than to the sale of margarine?—No, because margarine is a new production; and it is only natural to suppose, without casting any odium upon the article itself (I do not wish to do so so long as it is sold in its own character) that its coming into competition with butter would affect the price of butter.

3894. As a matter of fact, since the Margarine Act was passed is it not the fact that the importations of butter have increased by 50 per cent.?—I did not know that.

3895. Whilst the importations of margarine have remained absolutely stationary?—I did not know that.

3896. With regard to the butter sold in London, is it not the fact that very little English butter is sold in London at all?—I do not know that.

3897. And that almost all the butter sold here is foreign?—I do not know that.

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A P P E N D I X.

APPENDIX, No. 1.

PAPER handed in by Mr. *H. Preston-Thomas*, 6 July 1894.

PROSECUTIONS, 1893.

ARTICLE.	Number of Samples reported as Adulterated.	Number of Proceedings taken.	Number of Cases dismissed.	Number of Cases withdrawn.	Number of Costs only inflicted.	Number of Penalties imposed.	Total Penalties (Costs excluded where separately shown). £. s. d.
Milk	2,310	1,542	152	55	43	1,292	2,914 19 2
Bread and flour	2	1	—	—	—	1 (bread).	1 – –
Butter	794	604	29	6	18	551	1,150 1 6
Coffee	214	129	12	1	4	112	138 7 5
Sugar	3	—	—	—	—	—	—
Mustard	54	23	4	—	1	18	9 3 –
Pepper	21	7	—	—	—	7	7 10 6
Lard	127	94	18	7	10	59	92 10 6
Wine	1	—	—	—	—	—	—
Spirits	782	552	28	4	43	477	576 9 3
Beer	16	—	—	—	—	—	—
Drugs, rhubarb	15	16	1	—	1	14	12 14 6
„ nitre	11	5	1	—	1	3	– 13 6
„ saffron	4	1	—	—	—	1	1 – –
„ liquorice	5	5	3	—	—	2	– 11 –
„ quinine	2	1	—	—	—	1	– 2 6
„ paregoric	12	5	—	—	—	5	5 19 –
„ sulphur	4	1	—	—	—	1	– 10 –
„ salvolatile	2	1	—	—	—	1	– 1 –
Other drugs	30	—	—	—	—	—	—
Other articles :							
Soda water, &c.	32	18	4	—	—	14	3 15 6
Chewing gum	2	1	—	—	—	1	– 10 –
Jam	2	1	1	—	—	—	—
Arrowroot	1	1	—	—	—	1	1 – –
Cocoa	58	22	4	—	—	18	12 17 6
Olive oil	5	6	1	—	1	4	3 15 –
Pressed peas	14	1	—	—	—	1	– 5 –
Ginger	5	2	1	—	—	1	– 10 –
Vinegar	165	97	16	3	4	74	120 3 6
Yeast	20	13	2	—	3	8	2 16 10
Baking powder	43	17	1	1	—	15	13 6 6
Cheese	12	5	1	—	—	4	20 – –
Sundries	22	2	2	—	—	—	—
Oatmeal	3	1	—	—	—	1	1 – –
TOTAL	4,793	3,174	281	77	129	2,687	5,091 12 8

APPENDIX, No. 2.

PAPER handed in by Mr. *Preston-Thomas*, 6 July 1894.

ABSTRACT of Reports of Public Analysts for the Year 1893.

	Population, 1891.	NUMBER OF SAMPLES.																	
		Milk.		Bread.		Flour.		Butter.		Coffee.		Sugar.		Mustard		Confectionery and Jam.		Pepper.	
		Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.
THE METROPOLIS	4,232,118	3,412	892	170	0	127	0	1,346	281	546	49	78	3	259	9	134	0	340	7
COUNTIES.																			
Bedford	160,704	28	3	1	0	–	–	37	6	6	1	5	0	7	0	3	0	15	0
Berks	236,163	34	7	17	0	2	0	28	1	15	0	1	0	3	0	1	0	5	0
Bucks	185,284	65	6	22	0	–	–	26	6	11	1	–	–	–	–	3	0	–	–
Cambridge	185,822	37	1	25	0	–	–	37	0	2	0	–	–	–	–	1	0	1	0
Chester	743,869	269	14	4	0	4	0	176	22	33	2	2	0	4	0	4	0	14	0
Cornwall	322,571	18	4	18	0	–	–	21	4	10	3	9	0	5	0	9	0	15	0
Cumberland	266,549	57	6	2	0	1	0	12	0	9	1	–	–	1	0	–	–	9	0
Derby	520,914	81	8	3	0	2	0	34	11	13	6	1	0	–	–	–	–	3	0
Devon	631,808	116	32	10	0	4	0	66	2	14	1	3	0	1	0	3	0	4	0
Dorset	194,517	62	5	1	0	4	0	57	2	9	0	–	–	3	1	–	–	2	0
Durham	1,016,559	134	15	5	0	5	0	85	4	23	4	4	0	1	0	17	0	27	0
Essex	784,258	297	67	2	0	–	–	262	30	34	5	–	–	27	2	–	–	41	0
Gloucester	645,574	360	35	12	0	8	0	307	23	24	1	10	0	18	4	1	0	78	0
Hereford	115,949	11	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Herts	224,550	60	8	–	–	–	–	27	4	4	2	–	–	1	0	–	–	1	0
Hunts	54,969	3	0	5	0	2	0	5	0	3	0	2	0	3	0	–	–	1	0
Kent (ex-Met.)	808,736	258	51	2	0	–	–	114	15	58	4	8	0	37	3	2	0	53	0
Lancaster	3,906,721	3,599	288	79	0	16	0	589	108	158	20	4	0	60	1	61	4	147	3
Leicester	375,092	214	25	50	0	30	0	84	12	25	1	–	–	3	0	–	–	–	–
Lincoln	473,912	62	8	2	0	–	–	18	1	23	6	–	–	11	2	7	0	18	0
Middlesex (ex-Met.)	560,012	739	149	4	0	2	0	207	21	76	1	–	–	18	1	4	0	38	0
Monmouth	258,054	103	13	–	–	–	–	27	3	3	0	–	–	2	0	2	0	6	0
Norfolk	468,287	61	12	2	0	–	–	22	1	19	3	–	–	–	–	–	–	–	–
Northampton	299,508	55	8	1	0	–	–	52	15	4	1	–	–	–	–	–	–	3	0
Northumberland	506,030	145	20	1	0	5	0	26	1	5	0	24	0	–	–	19	0	2	0
Nottingham	445,823	88	22	1	0	1	0	54	9	13	1	–	–	3	0	2	0	4	0
Oxford	191,191	10	3	10	0	–	–	7	0	8	0	–	–	–	–	–	–	–	–
Rutland	20,659	6	0	–	–	–	–	–	–	2	1	–	–	3	1	–	–	–	–
Salop	236,339	25	5	–	–	–	–	14	1	15	3	–	–	1	0	–	–	2	0
Somerset	438,710	216	13	5	0	–	–	141	2	58	6	29	0	62	7	3	0	121	0
Southampton (including Isle of Wight).	690,097	318	54	9	0	1	1	85	7	53	5	–	–	35	2	–	–	6	0
Stafford	1,087,161	595	62	23	1	39	0	338	52	142	20	2	0	16	1	3	0	69	3
Suffolk	361,790	45	9	1	0	–	–	83	19	–	–	–	–	–	–	–	–	–	–
Surrey (ex-Met.)	521,551	395	60	10	0	13	0	218	16	20	4	9	0	5	2	2	0	3	0
Sussex	548,979	235	36	10	0	–	–	106	5	23	10	–	–	5	1	1	0	10	0
Warwick	838,030	712	118	77	0	23	0	313	37	66	0	1	0	34	2	32	0	72	7
Westmorland	66,098	18	2	–	–	–	–	2	0	1	0	–	–	1	0	–	–	2	0
Wilts	264,997	170	40	10	0	3	0	81	15	20	7	–	–	2	2	–	–	9	0
Worcester	385,309	97	10	1	0	1	0	92	7	20	4	1	0	4	1	–	–	15	0
York, East Riding	408,564	212	16	6	0	–	–	17	3	4	1	–	–	1	1	2	0	3	0
„ North Riding	360,369	59	4	–	–	1	0	24	1	3	2	1	0	2	0	–	–	11	0
„ West Riding	2,444,931	867	69	20	0	13	0	357	36	128	24	11	0	46	2	20	1	69	1
Anglesey	50,098	2	0	2	0	–	–	3	0	2	0	2	0	–	–	–	–	2	0
Brecknock	51,393	37	8	–	–	–	–	2	1	1	0	–	–	–	–	–	–	–	–
Cardigan	63,467	17	7	2	0	–	–	1	0	2	0	–	–	–	–	–	–	1	0
Carmarthen	130,566	19	3	–	–	–	–	2	0	–	–	–	–	–	–	–	–	3	0
Carnarvon	117,233	6	1	1	0	–	–	10	0	20	2	–	–	1	1	–	–	1	0
Denbigh	118,843	14	0	–	–	–	–	5	0	3	0	–	–	–	–	–	–	2	0
Flint	77,277	15	2	–	–	–	–	16	2	6	0	–	–	–	–	–	–	6	0
Glamorgan	687,218	1,070	84	72	0	71	0	148	8	109	12	30	0	11	8	10	2	76	0
Merioneth	49,212	2	0	–	–	–	–	–	–	1	0	–	–	–	–	1	0	–	–
Montgomery	58,003	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Pembroke	88,296	11	3	–	–	–	–	–	–	1	0	–	–	–	–	–	–	4	0
Radnor	21,791	2	0	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
TOTALS		15,543	2,310	698	1	378	1	5,784	794	1,848	214	237	3	696	54	347	7	1,314	21

APPENDIX, No. 2.

PAPER handed in by Mr. *Preston-Thomas*, 6 July 1894.

ABSTRACT of Reports of Public Analysts for the Year 1893.

NUMBER OF SAMPLES.																	
Tea.		Lard.		Wine.		Beer.		Spirits.		Drugs.		Other Articles.		TOTAL.			
Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Proportion Adulterated. 1893.	Proportion Adulterated. 1892.	
77	0	95	3	11	0	19	0	548	81	236	11	591	29	7,989	1,365	17·1	*17·0*	THE METROPOLIS.
																		COUNTIES.
10	0	10	0	–	–	18	1	15	7	–	–	15	0	170	18	10·6	*8·0*	Bedford.
2	0	2	0	–	–	2	0	2	0	–	–	1	0	115	8	7·0	*18·1*	Berks.
–	–	5	2	6	0	–	–	14	3	–	–	9	0	161	18	11·2	*12·9*	Bucks.
–	–	3	0	–	–	–	–	–	–	–	–	3	0	109	1	0·9	*21·7*	Cambridge.
1	0	62	0	2	0	–	–	91	8	7	0	159	5	832	51	6·1	*5·7*	Chester.
12	0	15	1	1	0	1	0	16	7	5	0	26	4	181	23	12·7	*7·0*	Cornwall.
–	–	17	0	–	–	2	0	84	10	–	–	2	0	196	17	8·7	*13·3*	Cumberland.
1	0	13	0	–	–	–	–	58	16	1	0	32	9	242	50	20·7	*27·1*	Derby.
3	0	4	0	–	–	4	0	20	3	8	0	15	2	275	40	14·5	*16·2*	Devon.
–	–	–	–	–	–	10	0	8	3	–	–	–	–	156	11	7·1	*4·8*	Dorset.
1	0	70	37	–	–	17	0	188	46	17	6	134	18	728	130	17·9	*14·7*	Durham.
26	0	46	2	–	–	6	0	26	3	2	0	43	7	812	116	14·3	*16·7*	Essex.
2	0	59	18	–	–	9	0	59	6	–	–	46	8	993	95	9·6	*6·8*	Gloucester.
–	–	–	–	–	–	–	–	–	–	–	–	–	–	11	2	18·2	–	Hereford.
–	–	3	0	–	–	20	0	5	2	–	–	3	1	124	17	13·7	*24·4*	Herts.
5	0	5	0	–	–	1	0	1	0	–	–	10	0	46	0	0·0	*2·4*	Hunts.
7	0	68	0	–	–	8	0	259	42	–	–	127	6	1,001	121	12·1	*11·8*	Kent (ex.-Met.).
41	0	292	12	2	1	68	1	563	65	55	1	424	51	6,158	555	9·0	*9·1*	Lancaster.
–	–	22	3	–	–	–	–	54	16	–	–	64	6	546	63	11·5	*9·8*	Leicester.
7	0	30	0	–	–	1	0	139	22	11	1	96	17	425	57	13·4	*26·4*	Lincoln.
–	–	38	1	–	–	6	0	32	5	19	0	132	40	1,315	218	16·6	*12·3*	Middlesex (ex.-Met.).
3	0	7	2	1	0	5	1	11	8	–	–	15	2	185	29	15·7	*14·8*	Monmouth.
7	0	24	3	–	–	4	0	23	10	2	1	22	3	186	33	17·7	*12·1*	Norfolk.
–	–	16	4	–	–	3	0	41	14	–	–	10	0	185	42	22·7	*13·2*	Northampton.
1	0	44	17	–	–	2	0	8	5	–	–	58	8	340	51	15·0	*6·8*	Northumberland.
2	0	15	2	–	–	–	–	46	27	–	–	30	6	259	67	25·9	*20·0*	Nottingham.
–	–	8	0	–	–	4	0	2	0	3	0	–	–	52	3	5·8	*7·7*	Oxford.
–	–	–	–	–	–	–	–	8	0	–	–	–	–	19	2	10·5	*25·0*	Rutland.
–	–	1	0	–	–	–	–	6	3	–	–	1	0	65	12	18·5	*26·7*	Salop.
81	0	68	0	19	0	30	0	223	26	30	0	92	5	1,178	59	5·0	*3·4*	Somerset.
2	0	18	0	–	–	8	0	178	32	34	2	76	5	823	108	13·1	*12·4*	Southampton (including Isle of Wight).
1	0	94	3	–	–	2	1	75	8	27	2	191	32	1,617	185	11·4	*8·8*	Stafford.
–	–	1	0	–	–	5	0	2	0	–		3	0	140	28	20·0	*20·0*	Suffolk.
1	0	46	3	–	–	9	1	72	9	–	–	35	4	838	99	11·8	*13·7*	Surrey (ex.-Met.).
3	0	32	2	–	–	–	–	76	15	2	0	27	4	530	73	13·8	*10 5*	Sussex.
16	0	65	0	–	–	57	10	113	20	118	29	173	18	1,872	241	12·9	*12·7*	Warwick.
–	–	1	0	–	–	–	–	10	3	–	–	5	0	40	5	12·5	*9·5*	Westmorland.
12	0	12	0	–	–	1	0	40	8	11	0	27	5	398	77	19·3	*7·9*	Wilts.
5	0	15	0	–	–	10	0	43	10	–	–	24	1	328	33	10·1	*11·4*	Worcester.
–	–	7	0	–	–	–	–	17	5	2	0	15	3	286	29	10·1	*7·4*	York, East Riding.
4	0	24	0	–	–	–	–	31	12	1	0	18	0	179	19	10·6	*9·4*	„ North Riding.
20	0	144	8	1	–	2	1	409	107	147	26	332	35	2,586	310	12 0	*13·6*	„ West Riding.
1	0	–	–	–	–	4	0	3	1	1	1	7	0	29	2	6·9	*15·2*	Anglesey.
–	–	1	0	–	–	–	–	4	2	–	–	3	1	48	12	25·0	*21·9*	Brecknock.
–	–	1	0	–	–	1	0	16	6	–	–	4	1	45	14	31·1	*10·7*	Cardigan.
–	–	–	–	–	–	–	–	5	5	–	–	3	2	32	10	31·2	–	Carmarthen.
18	0	–	–	–	–	3	0	23	13	6	3	1	0	90	20	22·2	*80·0*	Carnarvon.
–	–	–	–	–	–	–	–	19	9	2	1	1	1	46	11	23·9	*26·1*	Denbigh.
–	–	8	2	–	–	10	0	32	9	3	1	2	0	98	16	16·3	*18·2*	Flint.
22	0	87	2	–	–	9	0	226	59	1	0	158	38	2,100	213	10·1	*10·9*	Glamorgan.
–	–	1	0	–	–	–	–	9	5	–	–	1	0	15	5	33·3	*75·0*	Merioneth.
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	Montgomery.
–	–	1	0	–	–	–	–	9	4	–	–	–	–	26	7	26·9	*24·1*	Pembroke.
–	–	–	–	–	–	2	0	9	2	–	–	2	–	13	2	15·4	–	Radnor.
394	0	1,600	127	43	1	363	16	3,971	782	751	85	3,266	377	37,233	4,793	12·9	*12·4*	TOTALS.

ABSTRACT of Reports of Public Analysts for the Year 1893—*continued*.

	Population, 1891.	NUMBER OF SAMPLES.															
		Milk.		Bread.		Flour.		Butter.		Coffee.		Sugar.		Mustard.		Confectionery and Jam.	
		Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.
THE METROPOLIS.																	
Battersea	150,558	33	12	12	0	–	–	31	9	6	2	–	–	–	–	–	–
Bermondsey	84,682	110	39	8	0	4	0	39	5	22	12	10	0	8	0	–	–
Bethnal Green	129,132	39	4	–	–	–	–	14	5	–	–	–	–	4	0	–	–
Camberwell, St Giles	235,344	79	33	–	–	1	0	22	4	11	3	–	–	8	0	1	0
Chelsea	96,253	83	17	–	–	–	–	24	0	6	1	3	3	–	–	–	–
Clerkenwell	66,216	56	22	–	–	–	–	46	17	6	0	4	0	14	1	–	–
Fulham	91,639	63	14	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Greenwich	165,413	51	4	–	–	–	–	90	26	4	1	–	–	12	0	1	0
Hackney	229,542	101	26	3	0	2	0	18	2	18	1	–	–	8	0	–	–
Hammersmith	97,239	68	11	5	0	–	–	46	15	3	0	4	0	7	0	4	0
Hampstead, St. John	68,416	54	16	–	–	1	0	43	2	39	2	10	0	34	0	2	0
Holborn	33,485	45	13	–	–	–	–	15	2	4	0	3	0	11	0	–	–
Islington	319,143	213	42	5	0	7	0	6	0	12	2	5	0	7	1	–	–
Kensington	166,308	189	40	–	–	16	0	67	18	88	6	12	0	–	–	36	0
Lambeth	275,203	220	67	3	0	3	0	124	41	36	4	2	0	22	1	5	0
Lewisham	92,647	37	13	–	–	–	–	35	4	2	0	–	–	–	–	–	–
Limehouse	57,376	34	11	9	0	13	0	7	2	27	3	–	–	13	0	–	–
London, City of	37,487	47	0	–	–	–	–	4	0	4	0	–	–	–	–	–	–
Marylebone	142,404	217	24	–	–	1	0	105	4	28	0	–	–	21	0	59	0
Mile End Old Town	107,592	112	31	–	–	–	–	66	10	31	0	–	–	18	4	–	–
Newington, St. Mary	115,804	24	14	–	–	–	–	25	14	–	–	–	–	3	0	–	–
Paddington	117,846	191	40	–	–	–	–	60	2	41	4	–	–	4	0	–	–
Plumstead	88,539	69	21	–	–	6	0	10	0	15	0	4	0	14	0	–	–
Poplar	166,748	168	37	23	0	12	0	25	5	6	1	–	–	–	–	–	–
Rotherhithe	39,255	20	11	–	–	–	–	3	2	–	–	–	–	–	–	–	–
St. George, Hanover-square.	78,364	177	46	–	–	–	–	51	14	10	1	–	–	–	–	–	–
St. George-in-the-East	45,795	72	17	22	0	16	0	17	0	9	0	–	–	4	0	–	–
St. George-the-Martyr, Southwark.	59,712	37	14	7	0	1	0	24	5	2	1	–	–	–	–	1	0
St. Giles	39,782	173	33	–	–	–	–	17	3	20	3	–	–	–	–	–	–
St. Luke	42,440	15	7	4	0	3	0	27	4	5	0	–	–	9	1	24	0
St. Martin-in-the-Fields	14,616	3	0	3	0	–	–	3	0	3	0	6	0	–	–	–	–
St. Olave	12,723	24	10	–	–	–	–	3	0	3	0	–	–	–	–	–	–
St. Pancras	234,379	112	52	–	–	–	–	57	19	10	0	–	–	7	1	–	–
St. Saviour	27,177	62	20	–	–	–	–	16	3	9	0	–	–	4	0	–	–
Shoreditch, St. Leonard	124,009	99	53	–	–	–	–	16	1	4	1	–	–	–	–	–	–
Strand	25,122	78	32	11	0	–	–	64	22	3	0	–	–	–	–	–	–
Wandsworth	156,942	108	16	30	0	13	0	81	9	33	0	–	–	20	0	1	0
Westminster, St. Margaret and St. John.	55,539	35	7	–	–	3	0	24	11	6	1	–	–	3	0	–	–
Westminster, St. James	24,995	32	8	–	–	–	–	12	1	7	0	–	–	–	–	–	–
Whitechapel	73,552	27	4	25	0	25	0	2	0	6	0	15	0	–	–	–	–
Woolwich	40,848	35	11	–	–	–	–	7	0	6	0	–	–	4	0	–	–
BEDFORD.																	
County jurisdiction	102,675	8	0	1	0	–	–	33	2	5	0	5	0	7	0	3	0
Boroughs:																	
Bedford	28,023	3	0	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Luton	30,006	17	3	–	–	–	–	4	4	1	1	–	–	–	–	–	–
BERKS.																	
County jurisdiction	152,780	16	4	3	0	2	0	9	1	15	0	–	–	3	0	–	–
Boroughs:																	
Newbury	11,002	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
New Windsor	12,327	2	1	2	0	–	–	–	–	–	–	1	0	–	–	1	0
Reading	60,054	16	2	12	0	–	–	19	0	–	–	–	–	–	–	–	–

ABSTRACT of Reports of Public Analysts for the Year 1893—*continued*.

NUMBER OF SAMPLES.																		
Pepper.		Tea.		Lard.		Wine.		Beer.		Spirits.		Drugs.		Other Articles.		TOTAL.		
Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	
																		THE METROPOLIS.
–	–	–	–	–	–	–	–	–	–	18	4	6	0	–	–	106	27	Battersea.
3	0	–	–	5	1	1	0	–	–	21	4	1	1	16	0	248	62	Bermondsey.
4	0	–	–	–	–	–	–	–	–	–	–	–	–	–	–	61	9	Bethnal Green.
2	0	–	–	2	0	–	–	–	–	27	4	4	0	16	2	173	46	Camberwell, St. Giles.
6	0	1	0	6	0	–	–	–	–	8	0	–	–	14	1	151	22	Chelsea.
8	0	–	–	–	–	–	–	–	–	–	–	3	0	5	3	142	43	Clerkenwell.
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	63	14	Fulham.
11	0	–	–	6	0	–	–	–	–	11	0	2	0	3	0	191	31	Greenwich.
14	1	–	–	2	0	–	–	2	0	12	1	3	1	17	3	200	35	Hackney.
18	0	11	0	6	0	3	0	–	–	20	0	2	0	40	1	237	27	Hammersmith.
36	0	6	0	13	0	–	–	–	–	8	1	38	0	27	0	311	21	Hampstead, St. John.
15	0	1	0	–	–	–	–	–	–	1	0	3	0	18	0	116	15	Holborn.
16	0	10	0	6	0	–	–	–	–	27	6	18	2	46	3	378	56	Islington.
12	0	–	–	–	–	6	0	–	–	38	7	16	0	22	2	502	73	Kensington.
23	1	–	–	2	0	–	–	–	–	23	1	3	0	32	2	498	117	Lambeth.
–	–	–	–	–	–	–	–	–	–	–	–	1	1	2	0	77	18	Lewisham.
4	0	–	–	–	–	–	–	–	–	26	2	–	–	2	0	135	18	Limehouse.
–	–	2	0	–	–	–	–	–	–	2	0	22	0	17	0	98	0	London, City of.
23	0	17	0	8	0	–	–	–	–	61	3	13	0	41	2	595	33	Marylebone.
35	2	–	–	2	0	–	–	–	–	33	4	–	–	3	0	300	51	Mile End Old Town.
3	0	–	–	–	–	–	–	–	–	4	0	–	–	–	–	59	28	Newington, St. Mary.
8	0	2	0	18	0	–	–	–	–	8	0	–	–	2	0	334	46	Paddington.
8	0	8	0	–	–	–	–	–	–	20	5	32	0	36	0	222	26	Plumstead.
6	0	–	–	–	–	–	–	–	–	24	8	12	3	12	1	288	55	Poplar.
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	23	13	Rotherhithe.
25	1	10	0	–	–	–	–	15	0	40	6	15	0	37	0	380	68	St. George, Hanover-square.
6	0	–	–	–	–	–	–	–	–	6	2	–	–	–	–	152	19	St. George-in-the-East.
3	0	–	–	–	–	–	–	–	–	2	0	–	–	3	0	80	20	St. George-the-Martyr, Southwark.
8	1	–	–	–	–	–	–	–	–	20	0	–	–	26	0	264	40	St. Giles.
9	0	–	–	1	0	–	–	–	–	23	10	–	–	10	0	130	22	St. Luke.
–	–	–	–	–	–	–	–	–	–	3	2	–	–	3	0	24	2	St. Martin-in-the-Fields.
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	30	10	St. Olave.
2	0	–	–	7	2	–	–	–	–	–	–	–	–	5	0	200	74	St. Pancras.
2	0	2	0	–	–	–	–	–	–	26	6	2	0	2	0	125	29	St. Saviour.
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	119	55	Shoreditch, St. Leonard.
5	1	–	–	7	0	–	–	2	0	13	3	18	3	39	1	240	62	Strand.
18	0	1	0	4	0	–	–	–	–	4	2	–	–	32	2	345	29	Wandsworth.
3	0	–	–	–	–	–	–	–	–	3	0	–	–	9	0	86	19	Westminster, St. Margaret and St. John.
–	–	–	–	–	–	1	0	–	–	–	–	–	–	31	5	83	14	Westminster, St. James.
–	–	–	–	–	–	–	–	–	–	–	–	6	0	18	1	124	5	Whitechapel.
4	0	6	0	–	–	–	–	–	–	16	0	16	0	5	0	99	11	Woolwich.
																		BEDFORD.
14	0	10	0	10	0	–	–	12	1	9	1	–	–	15	0	132	4	County jurisdiction.
																		Boroughs:
–	–	–	–	–	–	–	–	6	0	–	–	–	–	–	–	9	0	Bedford.
1	0	–	–	–	–	–	–	–	–	6	6	–	–	–	–	29	14	Luton.
																		BERKS.
4	0	–	–	2	0	–	–	–	–	–	–	–	–	–	–	54	5	County jurisdiction.
																		Boroughs:
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	Newbury.
–	–	2	0	–	–	–	–	2	0	2	0	–	–	–	–	12	1	New Windsor.
1	0	–	–	–	–	–	–	–	–	–	–	–	–	1	0	49	2	Reading.

ABSTRACT of Reports of Public Analysts for the Year 1893—*continued.*

	Population, 1891.	NUMBER OF SAMPLES.															
		Milk.		Bread.		Flour.		Butter.		Coffee.		Sugar.		Mustard.		Confectionery and Jam.	
		Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.
BUCKINGHAM.																	
County jurisdiction	171,849	58	6	22	0	–	–	22	6	11	1	–	–	–	–	3	0
Borough:																	
Chepping Wycombe	13,435	7	0	–	–	–	–	4	0	–	–	–	–	–	–	–	–
CAMBRIDGE.																	
County jurisdiction	84,978	7	1	4	0	–	–	37	0	2	0	–	–	–	–	–	–
Isle of Ely	63,861	23	0	21	0	–	–	–	–	–	–	–	–	–	–	1	0
Borough:																	
Cambridge	36,983	7	0	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CHESTER.																	
County jurisdiction	463,108	185	7	–	–	–	–	128	11	11	0	–	–	1	0	–	–
Boroughs:																	
Birkenhead	99,857	34	1	–	–	–	–	24	7	7	0	2	0	3	0	4	0
Chester	37,105	5	0	–	–	–	–	1	0	–	–	–	–	–	–	–	–
Congleton	10,744	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Macclesfield	36,009	11	0	3	0	1	0	6	2	–	–	–	–	–	–	–	–
Stalybridge	26,783	6	0	–	–	–	–	–	–	1	0	–	–	–	–	–	–
Stockport	70,263	28	6	1	0	3	0	17	2	14	2	–	–	–	–	–	–
CORNWALL.																	
County jurisdiction	299,008	18	4	18	0	–	–	9	1	10	3	9	0	5	0	9	0
Boroughs:																	
Penzance	12,432	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Truro	11,131	–	–	–	–	–	–	12	3	–	–	–	–	–	–	–	–
CUMBERLAND.																	
County jurisdiction	227,373	39	4	2	0	1	0	12	0	9	1	–	–	1	0	–	–
Borough:																	
Carlisle	39,176	18	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DERBY.																	
County jurisdiction	382,343	36	3	–	–	–	–	23	6	9	6	–	–	–	–	–	–
Boroughs:																	
Chesterfield	22,009	5	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Derby	94,146	20	4	–	–	–	–	4	3	3	0	–	–	–	–	–	–
Glossop	22,416	14	1	–	–	1	0	1	0	1	0	1	0	–	–	–	–
DEVON.																	
County jurisdiction	431,403	37	7	4	0	–	–	6	0	2	0	3	0	1	0	3	0
Boroughs:																	
Barnstaple	13,058	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Devonport	54,803	6	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Exeter	37,404	39	9	6	0	4	0	16	0	12	1	–	–	–	–	–	–
Plymouth	84,248	34	15	–	–	–	–	44	2	–	–	–	–	–	–	–	–
Tiverton	10,892	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DORSET.																	
County jurisdiction	165,213	52	2	1	0	4	0	54	2	8	0	–	–	2	1	–	–
Boroughs:																	
Poole	15,438	4	1	–	–	–	–	3	0	1	0	–	–	1	0	–	–
Weymouth	13,866	6	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–

ABSTRACT of Reports of Public Analysts for the Year 1893—*continued.*

NUMBER OF SAMPLES.																		
Pepper.		Tea.		Lard.		Wine.		Beer.		Spirits.		Drugs.		Other Articles.		TOTAL.		
Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	
																		BUCKINGHAM.
–	–	–	–	2	0	6	0	–	–	8	2	–	–	4	0	136	15	County jurisdiction.
																		Borough :
–	–	–	–	3	2	–	–	–	–	6	1	–	–	5	0	25	3	Chepping Wycombe.
																		CAMBRIDGE.
1	0	–	–	3	0	–	–	–	–	–	–	–	–	–	–	54	1	County jurisdiction.
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	45	0	Isle of Ely.
																		Borough :
–	–	–	–	–	–	–	–	–	–	–	–	–	–	3	0	10	0	Cambridge.
																		CHESTER.
11	0	1	0	41	0	–	–	–	–	76	7	5	0	123	2	587	27	County jurisdiction.
																		Boroughs :
2	0	–	–	11	0	–	–	–	–	5	0	–	–	17	2	109	10	Birkenhead.
–	–	–	–	–	–	2	0	–	–	–	–	–	–	6	0	14	0	Chester.
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	Congleton.
–	–	–	–	3	0	–	–	–	–	1	0	–	–	8	1	33	3	Macclesfield.
1	0	–	–	–	–	–	–	–	–	–	–	–	–	–	–	8	0	Stalybridge.
–	–	–	–	7	0	–	–	–	–	9	1	2	0	–	–	81	11	Stockport.
																		CORNWALL.
15	0	12	0	15	1	1	0	1	0	16	7	5	0	26	4	169	20	County jurisdiction.
																		Boroughs :
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	Penzance.
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	12	3	Truro.
																		CUMBERLAND.
9	0	–	–	17	0	–	–	2	0	84	10	–	–	2	0	178	15	County jurisdiction.
																		Borough :
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	18	2	Carlisle.
																		DERBY.
2	0	–	–	7	0	–	–	–	–	10	3	1	0	12	5	100	23	County jurisdiction.
																		Boroughs :
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	5	2	Chesterfield.
–	–	–	–	3	0	–	–	–	–	47	13	–	–	12	3	89	23	Derby.
1	0	1	0	–	–	–	–	–	–	–	–	–	–	–	–	20	1	Glossop.
																		DEVON.
2	0	3	0	–	–	–	–	–	–	13	3	–	–	1	0	75	10	County jurisdiction.
																		Boroughs :
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	Barnstaple.
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	6	1	Devonport.
2	0	–	–	4	0	–	–	4	0	7	0	–	–	6	2	100	12	Exeter.
–	–	–	–	–	–	–	–	–	–	–	–	8	0	8	0	94	17	Plymouth.
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	Tiverton.
																		DORSET.
2	0	–	–	–	–	–	–	10	0	7	2	–	–	–	–	140	7	County jurisdiction.
																		Boroughs :
–	–	–	–	–	–	–	–	–	–	1	1	–	–	–	–	10	2	Poole.
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	6	2	Weymouth.

ABSTRACT of Reports of Public Analysts for the Year 1893—*continued.*

	Population, 1891.	NUMBER OF SAMPLES.															
		Milk.		Bread.		Flour.		Butter.		Coffee.		Sugar.		Mustard.		Confectionery and Jam.	
		Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.
DURHAM.																	
County jurisdiction	642,617	86	9	–	–	1	0	79	4	16	2	2	0	1	0	11	0
Boroughs:																	
Durham	14,863	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Gateshead	85,692	22	2	–	–	4	0	–	–	–	–	–	–	–	–	6	0
Hartlepool	21,271	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
South Shields	78,391	6	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Sunderland	131,015	2	0	5	0	–	–	–	–	5	0	–	–	–	–	–	–
West Hartlepool	42,710	18	3	–	–	–	–	6	0	2	2	2	0	–	–	–	–
ESSEX.																	
County jurisdiction	541,796	238	47	2	0	–	–	235	24	18	4	–	–	16	0	–	–
Boroughs:																	
Colchester	34,559	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
West Ham	204,903	59	20	–	–	–	–	27	6	16	1	–	–	11	2	–	–
GLOUCESTER.																	
County jurisdiction	384,552	85	8	10	0	5	0	257	19	20	1	10	0	13	3	–	–
Boroughs:																	
Bristol	221,578	253	27	2	0	3	0	46	3	4	0	–	–	5	1	1	0
Gloucester	39,444	22	0	–	–	–	–	4	1	–	–	–	–	–	–	–	–
HEREFORD.																	
County jurisdiction	95,682	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Borough:																	
Hereford	20,267	11	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–
HERTFORD.																	
County jurisdiction	207,264	42	7	–	–	–	–	27	4	4	2	–	–	1	0	–	–
Borough:																	
St. Albans	12,898	18	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–
HUNTINGDON.																	
County jurisdiction [No Borough.]	57,761	3	0	5	0	2	0	5	0	3	0	2	0	3	0	–	–
KENT.																	
County jurisdiction	575,113	135	30	1	0	–	–	98	13	56	4	8	0	35	3	2	0
Boroughs:																	
Canterbury	23,062	24	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Dover	33,300	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Folkestone	23,905	27	6	–	–	–	–	3	0	–	–	–	–	–	–	–	–
Gravesend	23,876	23	4	1	0	–	–	8	1	1	0	–	–	1	0	–	–
Maidstone	32,145	30	6	–	–	–	–	3	0	1	0	–	–	1	0	–	–
Margate	18,417	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Ramsgate	24,733	13	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Rochester	26,290	6	0	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Tunbridge Wells	27,895	–	–	–	–	–	–	2	1	–	–	–	–	–	–	–	–
LANCASTER.																	
County jurisdiction	1,505,861	474	42	17	0	4	0	190	33	65	5	1	0	14	0	3	0
Boroughs:																	
Accrington	38,603	4	0	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Ashton-under-Lyne	40,463	4	1	–	–	–	–	–	–	3	0	–	–	–	–	–	–
Bacup	23,498	1	0	1	0	–	–	2	1	–	–	–	–	–	–	–	–
Barrow-in-Furness	51,712	16	2	–	–	–	–	3	0	–	–	–	–	7	0	–	–
Blackburn	120,064	20	0	–	–	–	–	23	2	1	0	–	–	–	–	–	–
Blackpool	23,846	23	2	2	0	–	–	21	7	3	0	1	0	–	–	–	–
Bolton	115,002	17	1	–	–	–	–	18	1	11	1	–	–	–	–	7	0
Bootle	49,217	34	7	–	–	–	–	14	3	5	2	–	–	–	–	–	–
Burnley	87,016	35	0	5	0	–	–	13	2	1	1	1	0	2	0	10	0
Bury	57,212	18	1	–	–	–	–	13	9	1	0	–	–	–	–	1	0
Clitheroe	10,815	–	–	–	–	–	–	1	1	–	–	–	–	–	–	–	–
Lancaster	81,038	23	1	1	0	–	–	5	1	2	0	–	–	–	–	–	–

ABSTRACT of Reports of Public Analysts for the Year 1893—*continued*.

NUMBER OF SAMPLES.																	
Pepper.		Tea.		Lard.		Wine.		Beer.		Spirits.		Drugs.		Other Articles.		TOTAL.		
Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	
																		DURHAM.
27	0	1	0	61	32	–	–	9	0	176	44	17	6	118	12	605	109	County jurisdiction.
																		Boroughs :
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	Durham.
–	–	–	–	5	2	–	–	4	0	–	–	–	–	11	5	52	9	Gateshead.
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	Hartlepool.
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	6	1	South Shields.
–	–	–	–	–	–	–	–	–	–	12	2	–	–	–	–	24	2	Sunderland.
–	–	–	–	4	3	–	–	4	0	–	–	–	–	5	1	41	9	West Hartlepool.
																		ESSEX.
27	0	25	0	30	1	–	–	6	0	22	2	–	–	37	7	656	85	County jurisdiction.
																		Boroughs :
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	Colchester.
14	0	1	0	16	1	–	–	–	–	4	1	2	0	6	0	156	31	West Ham.
																		GLOUCESTER.
46	0	2	0	29	1	–	–	9	0	53	6	–	–	18	2	557	40	County jurisdiction.
																		Boroughs :
32	0	–	–	30	17	–	–	–	–	–	–	–	–	28	6	404	54	Bristol.
–	–	–	–	–	–	–	–	–	–	6	0	–	–	–	–	32	1	Gloucester.
																		HEREFORD.
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	County jurisdiction.
																		Borough :
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	11	2	Hereford.
																		HERTFORD.
1	0	–	–	3	0	–	–	20	0	5	2	–	–	3	1	106	16	County jurisdiction.
																		Borough :
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	18	1	St. Albans.
																		HUNTINGDON.
1	0	5	0	5	0	–	–	1	0	1	0	–	–	10	0	46	0	County jurisdiction. [No Borough.]
																		KENT.
51	0	6	0	65	0	–	–	–	–	250	37	–	–	125	6	832	93	County jurisdiction.
																		Boroughs :
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	24	2	Canterbury.
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	Dover.
–	–	–	–	–	–	–	–	–	–	2	1	–	–	–	–	32	7	Folkestone.
2	0	1	0	–	–	–	–	–	–	–	–	–	–	2	0	39	5	Gravesend.
–	–	–	–	3	0	–	–	–	–	7	4	–	–	–	–	45	10	Maidstone.
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	Margate.
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	13	3	Ramsgate.
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	6	0	Rochester.
–	–	–	–	–	–	–	–	8	0	–	–	–	–	–	–	10	1	Tunbridge Wells.
																		LANCASTER.
52	1	8	0	150	5	–	–	11	0	299	47	–	–	74	1	1,362	134	County jurisdiction.
																		Boroughs :
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	4	0	Accrington.
–	–	–	–	2	0	–	–	–	–	2	1	–	–	2	1	13	3	Ashton-under-Lyne
–	–	1	0	2	0	–	–	2	0	4	0	1	0	5	1	19	2	Bacup.
7	0	–	–	3	0	–	–	9	0	4	0	–	–	–	–	49	2	Barrow-in-Furness.
1	0	–	–	17	1	–	–	–	–	–	–	–	–	1	1	63	4	Blackburn.
–	–	–	–	4	0	–	–	3	0	3	0	–	–	5	0	65	9	Blackpool.
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	53	3	Bolton.
–	–	–	–	9	0	–	–	–	–	27	0	–	–	6	3	95	15	Bootle.
2	0	2	0	7	1	–	–	–	–	5	0	3	0	20	3	106	7	Burnley.
1	0	–	–	2	0	–	–	–	–	2	0	–	–	7	0	45	10	Bury.
–	–	–	–	1	0	–	–	–	–	2	0	–	–	3	0	7	1	Clitheroe.
9	0	–	–	–	–	–	–	–	–	3	0	–	–	–	–	43	2	Lancaster.

ABSTRACT of Reports of Public Analysts for the Year 1893—*continued.*

	Population, 1891.	NUMBER OF SAMPLES.															
		Milk.		Bread.		Flour.		Butter.		Coffee.		Sugar.		Mustard.		Confectionery and Jam.	
		Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.
LANCASTER—*continued.*																	
Boroughs—*continued.*																	
Liverpool	517,980	663	119	6	0	3	0	38	4	19	11	–	–	12	0	18	4
Manchester	505,368	1,110	61	41	0	–	–	133	28	31	0	–	–	20	1	19	0
Oldham	131,463	84	7	–	–	–	–	7	3	–	–	–	–	–	–	3	0
Preston	107,573	14	3	1	0	–	–	4	0	–	–	–	–	1	0	–	–
Rochdale	71,401	117	5	–	–	–	–	13	1	6	0	–	–	4	0	–	–
Saint Helens	71,288	23	2	–	–	–	–	6	0	–	–	–	–	–	–	–	–
Salford	198,139	854	27	1	0	–	–	39	9	–	–	–	–	–	–	–	–
Southport	41,406	6	0	–	–	–	–	4	0	–	–	–	–	–	–	–	–
Warrington	52,743	17	4	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Wigan	55,013	42	3	4	0	9	0	42	3	10	0	1	0	–	–	–	–
LEICESTER.																	
County jurisdiction	200,468	61	11	44	0	21	0	74	10	22	1	–	–	–	–	–	–
Borough:																	
Leicester	174,624	153	14	6	0	9	0	10	2	3	0	–	–	3	0	–	–
LINCOLN.																	
County jurisdiction:																	
Parts of Holland	60,929	18	3	–	–	–	–	1	0	1	0	–	–	6	1	6	0
„ Kesteven	89,164	9	1	2	0	–	–	3	0	5	2	–	–	–	–	–	–
„ Lindsey	189,015	13	1	–	–	–	–	9	1	15	4	–	–	4	1	1	0
Boroughs:																	
Boston	14,593	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Grantham	16,746	8	0	–	–	–	–	3	0	2	0	–	–	–	–	–	–
Grimsby	51,934	7	2	–	–	–	–	2	0	–	–	–	–	1	0	–	–
Lincoln	41,491	7	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Louth	10,040	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MIDDLESEX (Extra-Metropolitan).																	
County jurisdiction [No Borough.]	560,012	739	149	4	0	2	0	207	21	76	1	–	–	18	1	4	0
MONMOUTH.																	
County jurisdiction	203,347	71	12	–	–	–	–	22	2	2	0	–	–	1	0	1	0
Borough:																	
Newport	54,707	32	1	–	–	–	–	5	1	1	0	–	–	1	0	1	0
NORFOLK.																	
County jurisdiction	299,623	26	2	–	–	–	–	20	1	16	2	–	–	–	–	–	–
Boroughs:																	
King's Lynn	18,360	15	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Norwich	100,970	13	4	2	0	–	–	2	0	3	1	–	–	–	–	–	–
Yarmouth, Great	49,334	7	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–
NORTHAMPTON.																	
County jurisdiction	178,076	41	6	–	–	–	–	30	10	4	1	–	–	–	–	–	–
Soke of Peterborough	35,249	1	0	1	0	–	–	2	1	–	–	–	–	–	–	–	–
Boroughs:																	
Northampton	61,012	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Peterborough	25,171	13	2	–	–	–	–	20	4	–	–	–	–	–	–	–	–
NORTHUMBERLAND.																	
County jurisdiction	259,765	1	0	–	–	–	–	1	0	–	–	18	0	–	–	16	0
Boroughs:																	
Berwick-upon-Tweed	13,377	4	1	1	0	1	0	–	–	–	–	–	–	–	–	–	–
Newcastle-on-Tyne	186,300	130	18	–	–	4	0	25	1	5	0	6	0	–	–	3	0
Tynemouth	46,588	10	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–

ABSTRACT of Reports of Public Analysts for the Year 1893—*continued.*

NUMBER OF SAMPLES.																		
Pepper.		Tea.		Lard.		Wine.		Beer.		Spirits.		Drugs.		Other Articles.		TOTAL.		
Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	
																		LANCASTER—*continued.*
																		Boroughs—*continued.*
31	2	14	0	20	2	1	0	–	–	12	2	16	0	116	22	969	166	Liverpool.
33	0	12	0	55	2	–	–	32	0	35	1	27	1	99	8	1,647	102	Manchester.
–	–	–	–	6	0	–	–	–	–	3	1	–	–	3	0	106	11	Oldham.
–	–	–	–	1	1	–	–	5	1	7	1	6	0	6	0	45	6	Preston.
5	0	–	–	3	0	–	–	–	–	40	7	–	–	–	–	188	13	Rochdale.
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	29	2	Saint Helens.
2	0	–	–	10	0	1	1	6	0	48	0	2	0	47	10	1,010	47	Salford.
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	10	0	Southport.
–	–	–	–	–	–	–	–	–	–	14	4	–	–	1	0	32	8	Warrington.
4	0	4	0	–	–	–	–	–	–	53	1	–	–	29	1	198	8	Wigan.
																		LEICESTER.
–	–	–	–	22	3	–	–	–	–	42	8	–	–	58	6	344	39	County jurisdiction.
																		Borough :
–	–	–	–	–	–	–	–	–	–	12	8	–	–	6	0	202	24	Leicester.
																		LINCOLN.
																		County jurisdiction :
1	0	4	0	2	0	–	–	–	–	26	4	–	–	3	2	68	10	Parts of Holland.
–	–	1	0	6	0	–	–	–	–	43	4	3	0	11	0	83	7	„ Kesteven.
16	0	2	0	13	0	–	–	1	0	66	12	8	1	48	9	196	29	„ Lindsey.
																		Boroughs :
–	–	–	–	–	–	–	–	–	–	–	–	–	–	6	0	6	0	Boston.
–	–	–	–	8	0	–	–	–	–	–	–	–	–	4	0	25	0	Grantham.
1	0	–	–	1	0	–	–	–	–	4	2	–	–	2	1	18	5	Grimsby.
–	–	–	–	–	–	–	–	–	–	–	–	–	–	22	5	29	6	Lincoln.
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	Louth.
																		MIDDLESEX (Extra-Metropolitan).
38	0	–	–	38	1	–	–	6	0	32	5	19	0	132	40	1,315	218	County jurisdiction. [No Borough.]
																		MONMOUTH.
1	0	2	0	7	2	1	0	5	1	11	8	–	–	13	2	137	27	County jurisdiction.
																		Borough :
5	0	1	0	–	–	–	–	–	–	–	–	–	–	2	0	48	2	Newport.
																		NORFOLK.
–	–	4	0	24	3	–	–	4	0	12	4	2	1	17	3	125	16	County jurisdiction.
																		Boroughs :
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	15	3	King's Lynn.
–	–	3	0	–	–	–	–	–	–	11	6	–	–	5	0	39	11	Norwich.
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	7	3	Yarmouth, Great.
																		NORTHAMPTON.
3	0	–	–	16	4	–	–	3	0	38	13	–	–	10	0	145	34	County jurisdiction.
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	4	1	Soke of Peterborough.
																		Boroughs :
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	Northampton.
–	–	–	–	–	–	–	–	–	–	3	1	–	–	–	–	36	7	Peterborough.
																		NORTHUMBERLAND.
–	–	–	–	40	16	–	–	–	–	–	–	–	–	37	6	113	22	County jurisdiction.
																		Boroughs :
–	–	1	0	–	–	–	–	–	–	1	1	–	–	1	0	9	2	Berwick-upon-Tweed.
2	0	–	–	4	1	–	–	2	0	4	1	–	–	20	2	205	23	Newcastle-on-Tyne.
–	–	–	–	–	–	–	–	–	–	3	3	–	–	–	–	13	4	Tynemouth.

ABSTRACT of Reports of Public Analysts for the Year 1893—*continued.*

	Population, 1891.	NUMBER OF SAMPLES.															
		Milk.		Bread.		Flour.		Butter.		Coffee.		Sugar.		Mustard.		Confectionery and Jam.	
		Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.
NOTTINGHAM.																	
County jurisdiction	217,489	58	18	–	–	–	–	25	4	10	1	–	–	2	0	2	0
Boroughs:																	
Newark	14,457	2	0	–	–	1	0	4	0	3	0	–	–	1	0	–	–
Nottingham	213,877	28	4	1	0	–	–	25	5	–	–	–	–	–	–	–	–
OXFORD.																	
County jurisdiction	132,681	1	0	8	0	–	–	7	0	8	0	–	–	–	–		–
Boroughs:																	
Banbury	12,768	5	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Oxford	45,742	4	1	2	0	–	–	–	–	–	–	–	–	–	–	–	–
RUTLAND.																	
County jurisdiction (No Borough.)	20,659	6	0	–	–	–	–	–	–	2	1	–	–	3	1	–	–
SALOP.																	
County jurisdiction	193,669	10	1	–	–	–	–	10	1	14	3	–	–	–	–	–	–
Boroughs:																	
Shrewsbury	26,967	15	4	–	–	–	–	4	0	1	0	–	–	1	0	–	–
Wenlock	15,703	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SOMERSET.																	
County jurisdiction	374,430	119	0	1	0	–	–	128	2	57	6	29	0	62	7	1	0
Boroughs:																	
Bath	51,844	97	13	4	0	–	–	13	0	1	0	–	–	–	–	2	0
Bridgwater	12,436	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SOUTHAMPTON.																	
County jurisdiction	367,776	102	15	–	–	–	–	24	2	13	1	–	–	26	0	–	–
Isle of Wight	67,720	9	1	–	–	–	–	17	0	8	0	–	–	9	2	–	–
Boroughs:																	
Portsmouth	159,251	140	25	9	0	1	1	8	0	6	2	–	–	–	–	–	–
Ryde	10,952	5	0	–	–	–	–	8	1	–	–	–	–	–	–	–	–
Southampton	65,325	62	13	–	–	–	–	27	3	26	2	–	–	–	–	–	–
Winchester	19,073	–	–	–	–	–	–	1	1	–	–	–	–	–	–	–	–
STAFFORD.																	
County jurisdiction	799,838	462	34	19	1	34	0	234	37	107	16	–	–	6	1	1	0
Boroughs:																	
Hanley	54,946	24	9	2	0	5	0	20	0	16	0	–	–	7	0	2	0
Newcastle-under-Lyme	18,452	8	1	–	–	–	–	4	1	1	1	–	–	–	–	–	–
Walsall	71,789	12	0	–	–	–	–	3	0	–	–	–	–	1	0	–	–
West Bromwich	59,474	50	13	2	0	–	–	16	5	5	0	–	–	–	–	–	–
Wolverhampton	82,662	39	5	–	–	–	–	61	9	13	3	2	0	2	0	–	–
SUFFOLK.																	
County jurisdiction:																	
Eastern Division	183,478	30	6	1	0	–	–	69	17	–	–	–	–	–	–	–	–
Western Division	104,322	12	2	–	–	–	–	7	1	–	–	–	–	–	–	–	–
Boroughs:																	
Bury St. Edmunds	16,630	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Ipswich	57,360	3	1	–	–	–	–	7	1	–	–	–	–	–	–	–	–
SURREY.																	
County jurisdiction	382,190	253	42	–	–	–	–	197	16	9	2	–	–	1	1	1	0
Boroughs:																	
Croydon	102,695	139	18	10	0	10	0	9	0	7	1	7	0	–	–	–	–
Guildford	14,020	1	0	–	–	3	0	12	0	4	1	2	0	4	1	1	0
Reigate	22,646	2	0	–	–	–	–	–	–	–	–	–	–	–	–	–	–

ABSTRACT of Reports of Public Analysts for the Year 1893—*continued.*

NUMBER OF SAMPLES.																	
Pepper.		Tea.		Lard.		Wine.		Beer.		Spirits.		Drugs.		Other Articles.		Total.		
Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	
																		NOTTINGHAM.
2	0	2	0	7	1	–	–	–	–	37	25	–	–	17	4	162	53	County jurisdiction.
																		Boroughs:
2	0	–	–	–	–	–	–	–	–	–	–	–	–	–	–	13	0	Newark.
–	–	–	–	8	1	–	–	–	–	9	2	–	–	13	2	84	14	Nottingham.
																		OXFORD.
–	–	–	–	8	0	–	–	–	–	–	–	1	0	–	–	33	0	County jurisdiction.
																		Boroughs:
–	–	–	–	–	–	–	–	4	0	2	0	2	0	–	–	13	2	Banbury.
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	6	1	Oxford.
																		RUTLAND.
–	–	–	–	–	–	–	–	–	–	8	0	–	–	–	–	19	2	County jurisdiction.
																		(No Borough.)
																		SALOP.
1	0	–	–	1	0	–	–	–	–	6	3	–	–	1	0	43	8	County jurisdiction.
																		Boroughs:
1	0	–	–	–	–	–	–	–	–	–	–	–	–	–	–	22	4	Shrewsbury.
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	Wenlock.
																		SOMERSET.
120	0	81	0	66	0	19	0	10	0	213	22	30	0	82	5	1,018	42	County jurisdiction.
																		Boroughs:
1	0	–	–	2	0	–	–	20	0	10	4	–	–	10	0	160	17	Bath.
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	Bridgwater.
																		SOUTHAMPTON.
–	–	2	0	7	0	–	–	–	–	132	23	–	–	30	3	336	44	County jurisdiction.
–	–	–	–	–	–	–	–	8	0	17	5	17	2	16	0	101	10	Isle of Wight.
																		Boroughs:
6	0	–	–	–	–	–	–	–	–	14	2	14	0	19	0	217	30	Portsmouth.
–	–	–	–	–	–	–	–	–	–	7	0	–	–	–	–	20	1	Ryde.
–	–	–	–	11	0	–	–	–	–	8	2	3	0	11	2	148	22	Southampton.
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	1	Winchester.
																		STAFFORD.
44	2	1	0	77	3	–	–	2	1	39	4	12	2	156	24	1,194	125	County jurisdiction.
																		Boroughs:
7	0	–	–	3	0	–	–	–	–	10	0	3	0	22	7	121	16	Hanley.
–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	0	15	3	Newcastle-under-Lyme.
–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	0	17	0	Walsall.
16	1	–	–	6	0	–	–	–	–	12	2	12	0	7	0	126	21	West Bromwich.
2	0	–	–	8	0	–	–	–	–	14	2	–	–	3	1	144	20	Wolverhampton.
																		SUFFOLK.
																		County jurisdiction:
–	–	–	–	1	0	–	–	5	0	2	0	–	–	2	0	110	23	Eastern Division.
–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	0	20	3	Western Division.
																		Boroughs:
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	Bury St. Edmunds.
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	10	2	Ipswich.
																		SURREY.
–	–	–	–	34	3	–	–	9	1	53	9	–	–	23	1	580	75	County jurisdiction.
																		Boroughs:
–	–	–	–	4	0	–	–	–	–	–	–	–	–	2	0	188	19	Croydon.
3	0	1	0	8	0	–	–	–	–	19	0	–	–	10	3	68	5	Guildford.
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	0	Reigate.

ABSTRACT of Reports of Public Analysts for the Year 1893—*continued.*

	Population, 1891.	NUMBER OF SAMPLES.															
		Milk.		Bread.		Flour.		Butter.		Coffee.		Sugar.		Mustard.		Confectionery and Jam.	
		Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.
SUSSEX.																	
County jurisdiction :																	
Eastern Division	205,295	50	7	2	0	–	–	69	4	7	0	–	–	–	–	–	–
Western Division	140,619	18	0	–	–	–	–	17	0	–	–	–	–	–	–	–	–
Boroughs :																	
Brighton	115,873	114	24	6	0	–	–	12	1	12	8	–	–	3	0	–	–
Eastbourne	34,969	27	3	2	0	–	–	3	0	4	2	–	–	2	1	–	–
Hastings	52,223	26	2	–	–	–	–	5	0	–	–	–	–	–	–	1	0
WARWICK.																	
County jurisdiction	268,360	328	43	4	0	2	0	141	18	26	0	–	–	18	2	8	0
Boroughs :																	
Birmingham	478,113	328	63	73	0	21	0	146	16	40	0	1	0	16	0	24	0
Coventry	52,724	24	6	–	–	–	–	7	2	–	–	–	–	–	–	–	–
Leamington	26,930	15	4	–	–	–	–	17	1	–	–	–	–	–	–	–	–
Warwick	11,903	17	2	–	–	–	–	2	0	–	–	–	–	–	–	–	–
WESTMORLAND.																	
County jurisdiction	51,668	11	1	–	–	–	–	2	0	1	0	–	–	1	0	–	–
Borough :																	
Kendal	14,430	7	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–
WILTS.																	
County jurisdiction	249,464	147	37	10	0	3	0	61	13	14	7	–	–	2	2	–	–
Borough :																	
Salisbury	15,533	23	3	–	–	–	–	20	2	6	0	–	–	–	–	–	–
WORCESTER.																	
County jurisdiction	271,858	47	3	1	0	–	–	46	1	15	3	1	0	4	1	–	–
Boroughs :																	
Dudley	45,740	–	–	–	–	–	–	22	2	4	1	–	–	–	–	–	–
Kidderminster	24,803	33	4	–	–	1	0	11	2	–	–	–	–	–	–	–	–
Worcester	42,908	17	3	–	–	–	–	13	2	1	0	–	–	–	–	–	–
YORK—EAST RIDING.																	
County jurisdiction	128,977	19	2	6	0	–	–	2	0	1	0	–	–	1	1	2	0
Boroughs :																	
Beverley	12,539	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Kingston-on-Hull	200,044	168	11	–	–	–	–	12	1	3	1	–	–	–	–	–	–
York	67,004	25	3	–	–	–	–	3	2	–	–	–	–	–	–	–	–
YORK—NORTH RIDING.																	
County jurisdiction	251,061	18	2	–	–	1	0	9	1	2	1	1	0	1	0	–	–
Boroughs :																	
Middlesborough	75,532	25	1	–	–	–	–	13	0	–	–	–	–	1	0	–	–
Scarborough	33,776	16	1	–	–	–	–	2	0	1	1	–	–	–	–	–	–
YORK—WEST RIDING.																	
County jurisdiction	1,220,583	232	15	17	0	2	0	251	23	97	12	11	0	34	1	8	1
Boroughs :																	
Bradford	216,361	146	12	–	–	1	0	17	1	–	–	–	–	–	–	6	0
Dewsbury	29,847	27	1	–	–	–	–	1	0	–	–	–	–	–	–	–	–
Doncaster	25,933	8	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Halifax	89,832	78	1	3	0	–	–	14	1	9	3	–	–	–	–	–	–
Huddersfield	95,420	62	5	–	–	–	–	27	4	2	0	–	–	1	0	–	–
Leeds	367,505	142	13	–	–	1	0	8	1	2	0	–	–	2	1	–	–
Rotherham	42,061	12	1	–	–	–	–	3	2	3	2	–	–	–	–	–	–
Sheffield	324,243	131	18	–	–	9	0	33	3	15	7	–	–	9	0	6	0
Wakefield	33,146	29	1	–	–	–	–	3	0	–	–	–	–	–	–	–	–

ABSTRACT of Reports of Public Analysts for the Year 1893—*continued.*

NUMBER OF SAMPLES.																		
Pepper.		Tea.		Lard.		Wine.		Beer.		Spirits.		Drugs.		Other Articles.		TOTAL.		
Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	
																		SUSSEX.
																		County jurisdiction :
3	0	3	0	11	0	–	–	–	–	38	5	–	–	4	0	187	16	Eastern Division.
–	–	–	–	7	2	–	–	–	–	16	6	–	–	3	1	61	9	Western Division.
																		Boroughs :
7	0	–	–	8	0	–	–	–	–	15	2	–	–	16	2	193	37	Brighton.
–	–	–	–	3	0	–	–	–	–	5	1	2	0	3	0	51	7	Eastbourne.
–	4	–	–	3	0	–	–	–	–	2	1	–	–	1	1	38	4	Hastings.
																		WARWICK.
32	2	16	0	32	0	–	–	3	0	102	17	13	2	47	8	772	92	County jurisdiction.
																		Boroughs :
40	5	–	–	32	0	–	–	54	10	9	1	100	27	119	10	1,003	132	Birmingham.
–	–	–	–	1	0	–	–	–	–	2	2	5	0	7	0	46	10	Coventry.
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	32	5	Leamington.
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	19	2	Warwick.
																		WESTMORLAND.
2	0	–	–	1	0	–	–	–	–	10	3	–	–	5	0	33	4	County jurisdiction.
																		Borough :
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	7	1	Kendal.
																		WILTS.
9	0	–	–	9	0	–	–	1	0	37	7	11	0	14	3	318	69	County jurisdiction.
																		Borough :
–	–	12	0	3	0	–	–	–	–	3	1	–	–	13	2	80	8	Salisbury.
																		WORCESTER.
7	0	5	0	13	0	–	–	10	0	36	7	–	–	15	0	200	15	County jurisdiction.
																		Boroughs :
4	0	–	–	–	–	–	–	–	–	–	–	–	–	–	–	30	3	Dudley.
–	–	–	–	1	0	–	–	–	–	6	3	–	–	5	1	57	10	Kidderminster.
4	0	–	–	1	0	–	–	–	–	1	0	–	–	4	0	41	5	Worcester.
																		YORK—EAST RIDING.
3	0	–	–	4	0	–	–	–	–	11	4	1	0	12	2	62	9	County jurisdiction.
																		Boroughs :
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	Beverley.
–	–	–	–	–	–	–	–	–	–	6	1	1	0	–	–	190	14	Kingston-on-Hull.
–	–	–	–	3	0	–	–	–	–	–	–	–	–	3	1	34	6	York.
																		YORK—NORTH RIDING.
7	0	2	0	17	0	–	–	–	–	27	11	1	0	16	0	102	15	County jurisdiction.
																		Boroughs :
2	0	2	0	6	0	–	–	–	–	–	–	–	–	2	0	51	1	Middlesborough.
2	0	–	–	1	0	–	–	–	–	4	1	–	–	–	–	26	3	Scarborough.
																		YORK—WEST RIDING.
50	0	13	0	114	4	1	0	1	0	408	107	116	20	221	14	1,576	197	County jurisdiction.
																		Boroughs :
17	1	–	–	1	0	–	–	–	–	1	0	7	4	23	0	219	18	Bradford.
–	–	–	–	1	0	–	–	–	–	–	–	–	–	–	–	29	1	Dewsbury.
–	–	–	–	2	1	–	–	–	–	–	–	–	–	4	1	14	4	Doncaster.
–	–	–	–	–	–	–	–	–	–	–	–	15	2	10	0	129	7	Halifax.
–	–	–	–	1	0	–	–	–	–	–	–	–	–	2	0	95	9	Huddersfield.
2	0	–	–	22	3	–	–	1	1	–	–	9	0	50	9	239	29	Leeds.
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	18	5	Rotherham.
–	–	7	0	–	–	–	–	–	–	–	–	–	–	22	11	232	39	Sheffield.
–	–	–	–	3	0	–	–	–	–	–	–	–	–	–	–	35	1	Wakefield.

ABSTRACT of Reports of Public Analysts for the Year 1893—*continued.*

	Population, 1891.	NUMBER OF SAMPLES.															
		Milk.		Bread.		Flour.		Butter.		Coffee.		Sugar.		Mustard.		Confectionery and Jam.	
		Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.
WALES.																	
ANGLESEY.																	
County jurisdiction -	50,098	2	0	2	0	–	–	3	0	2	0	2	0	–	–	–	–
BRECKNOCK.																	
County jurisdiction -	51,393	37	8	–	–	–	–	2	1	1	0	–	–	–	–	–	–
CARDIGAN.																	
County jurisdiction -	63,467	17	7	2	0	–	–	1	0	2	0	–	–	–	–	–	–
CARMARTHEN.																	
County jurisdiction -	120,266	10	1	–	–	–	–	2	0	–	–	–	–	–	–	–	–
Borough :																	
Carmarthen - -	10,300	9	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CARNARVON.																	
County jurisdiction -	117,233	6	1	1	0	–	–	10	0	20	2	–	–	1	1	–	–
DENBIGH.																	
County jurisdiction -	118,843	14	0	–	–	–	–	5	0	3	0	–	–	–	–	–	–
FLINT.																	
County jurisdiction -	77,277	15	2	–	–	–	–	16	2	6	0	–	–	–	–	–	–
GLAMORGAN.																	
County jurisdiction -	456,841	432	53	54	0	53	0	62	6	44	12	18	0	8	7	7	0
Boroughs :																	
Cardiff - - -	121,915	395	13	18	0	18	0	54	1	57	0	12	0	–	–	–	–
Neath - - -	11,113	8	2	–	–	–	–	1	0	–	–	–	–	1	1	–	–
Swansea - - -	90,349	235	16	–	–	–	–	31	1	8	0	–	–	2	0	3	2
MERIONETH.																	
County jurisdiction -	49,212	2	0	–	–	–	–	–	–	1	0	–	–	–	–	–	–
MONTGOMERY.																	
County jurisdiction -	58,003	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
PEMBROKE.																	
County jurisdiction -	88,296	11	3	–	–	–	–	–	–	1	0	–	–	–	–	–	–
RADNOR.																	
County jurisdiction -	21,791	2	0	–	–	–	–	–	–	–	–	–	–	–	–	–	–

ABSTRACT of Reports of Public Analysts for the Year 1893—*continued.*

NUMBER OF SAMPLES.

Pepper.		Tea.		Lard.		Wine.		Beer.		Spirits.		Drugs.		Other Articles.		TOTAL.		
Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	Examined.	Adulterated.	
																		WALES.
																		ANGLESEY.
2	0	1	0	–	–	–	–	4	0	3	1	1	1	7	0	29	2	County jurisdiction.
																		BRECKNOCK.
–	–	–	–	1	0	–	–	–	–	4	2	–	–	3	1	48	12	County jurisdiction.
																		CARDIGAN.
1	0	–	–	1	0	–	–	1	0	16	6	–	–	4	1	45	14	County jurisdiction.
																		CARMARTHEN.
3	0	–	–	–	–	–	–	–	–	5	5	–	–	3	2	23	8	County jurisdiction.
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	9	2	Borough : Carmarthen.
																		CARNARVON.
1	0	18	0	–	–	–	–	3	0	23	13	6	3	1	0	90	20	County jurisdiction.
																		DENBIGH.
2	0	–	–	–	–	–	–	–	–	19	9	2	1	1	1	46	11	County jurisdiction.
																		FLINT.
6	0	–	–	8	2	–	–	10	0	32	9	3	1	2	0	98	16	County jurisdiction.
																		GLAMORGAN.
50	0	9	0	56	1	–	–	9	0	209	51	1	0	126	37	1,138	167	County jurisdiction.
15	0	13	0	6	1	–	–	–	–	–	–	–	–	12	0	600	15	Boroughs : Cardiff.
–	–	–	–	–	–	–	–	–	–	3	3	–	–	2	0	15	6	Neath.
11	0	–	–	25	0	–	–	–	–	14	5	–	–	18	1	347	25	Swansea.
																		MERIONETH.
–	–	–	–	1	0	–	–	–	–	9	5	–	–	1	0	15	5	County jurisdiction.
																		MONTGOMERY.
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	County jurisdiction.
																		PEMBROKE.
4	0	–	–	1	0	–	–	–	–	9	4	–	–	–	–	26	7	County jurisdiction.
																		RADNOR.
–	–	–	–	–	–	–	–	2	0	9	2	–	–	–	–	13	2	County jurisdiction.

APPENDIX, No. 3.

PAPER handed in by Mr. *R. Bannister*, 25 July 1894.

COPY of a Letter sent to the Chief of the Municipal Laboratory, Paris.

Government Laboratory, Somerset House, W.C.,
12 July 1894.

Sir,

THE question of standards for genuine milk having arisen in connection with the question of "Food Adulteration" now being inquired into by a Select Committee of the House of Commons, I should be pleased, having to give evidence thereon early next week, if you would furnish me with information on the following points :—

1. What are the standards of non-fatty and fat solids, respectively, adopted in Paris for determining the genuineness, or otherwise, of a sample of milk?

2. Is the total weight of the non-fats and fat together taken into account in coming to a conclusion as to the genuineness of a milk?

3. What variations below the standards for milk are allowed before legal proceedings are taken against the vendor?

4. What analytical methods are employed in milk analysis in Paris, and are there any available published investigations into the composition of the milk produced in France?

5. What are the analytical data employed in determining the genuineness of butter, and are any of the figures used as standards?

6. Has the Adulteration Act in force in Paris been adopted in the rest, or any other parts, of France?

I am, &c.
(signed) *R. Bannister.*

PRÉFECTURE de POLICE, Cabinet du Préfet.

Monsieur,

République Française, Paris, le 21 Juillet, 1894.

POUR répondre à votre désir, j'ai l'honneur de vous transmettre ci-joint, une note relative aux procédés employés par le Laboratoire Municipal de Paris, pour la récherché des falsifications de lait.

Agréez, Monsieur, l'assurance de ma considération la plus distinguée.

(signé) *Le Préfet de Police.*

Monsieur Bannister, Chef du Laboratoire National
de Somerset House, Londres, W.C.

NOTE en réponse aux questions posées par Monsieur le Chef du Laboratoire de Somerset House.

Préfecture de Police, Secrétariat Général,
Paris, le 17 Juillet, 1894.

POUR déterminer la valeur alimentaire des laits, ou prend pour guide le Rapport général sur les diverses questions relatives au commerce du lait, reproduit dans les Documents du Laboratoire Municipal, 2me édition, page 398. La composition moyenne des laits vendus à Paris est de 130 grammes d'extrait, 27 gr. de beurre, et 49 gr. de lactine par litre comme minima. Dans la pratique et suivant cette déliberation du conseil d'hygiène, le laboratoire calcule le mouillage du lait sur la base de 130 gr. d'extrait et l'écrémage sur la composition du lait à 130 gr. d'extrait et 40 gr. de beurre. Dans ces conditions le lait minimum à 115 gr. d'extrait trouvé par la commission du conseil d'hygiène représenterait le lait type mouillé à 11, 5 per cent. Mais comme dans des traiter faites sur des vaches de race hollandaise, le laboratoire à trouvé jusqu'à 108 et. 110 gr. d'extrait, d'autre part puis qu'il faut admettre que le mouillage ne peut-être reconnu par le débitant aux caractères extérieurs du lait que s'il est supérieur à 15 per cent. et qu'au dessous de cette limite sa bonne foi ne peut-être nusé en doute, la loi punissant non-seulement la falsification, l'opération du mouillage, mais aussi le fait de détention d'une marchandise sciencement falsifiée, pour ces raisons le laboratoire ne transmet à la justice comme mouillés que les laits mouillés à plus de 19 per cent. d'après le lait moyen, soit renfermant mouis de 105 gr. d'extrait. En résumé, que l'ou se base pour les poursuites sur une composition minima, ou sur une composition moyenne avec une tolérance fixeé pour le mouillage, le résultat est le même. Nous admettons comme limite minima des laits marchands, ainsi qu'il est expliqué, 105 gr. d'extrait et 27 gr. de beurre par litre. Mais il est bien convenu qu'ou récherché toujours, quand c'est possible, l'origine de la fraude par des prélèvements sur les voitures des garçons laitiéres, ou en gare ou dans les dépôts des compagnies laitiéres.

Pour les nourrisseurs habitant le département de la Seine, ou opère de même des traites sur place chaque fois que les laits prélevès en vente renferment mous de 130 gr. d'extrait et 40 gr. de beurre, en vérifiant avec soin la nourriture des vaches et leur race.

La considération de l'extrait dégraissé n'intervient dans notre pratique que pour le calcul du mouillage et de l'écrémage des laits dont nous possédons des types, c'est-à-dire en général pour les laits de traité.

Les méthodes d'analyse que nous employons sont décrites dans les Documents du Laboratoire, et plus récemment dans l'ouvrage paru chez Dumod et Vicq, dans l'Encyclopédie chimique de Frémy, sous le titre, Analyse des Matiéres Alimentaires.

Ce même ouvrage donne la déscription des méthodes analytiques adoptées pour le beurre. Nous calculons la proportion de margarine d'après les procédés de Kottstorfer et de Reichert-Meissel, opposés l'un à l'autre, et en nous basant sur la moyenne des indications.

Comme lois, les fraudes du lait poursuivies d'après les lois générales de 1891 et 1899 sur les falsifications des matiéres alimentaires ; pour les beurres il y a en outre une loi spéciale du 14 Mars 1887, un peu incompléte, et dont le remaniement figures à l'ordre du jour des Chambres.

Laboratoire de Chimie.—Prière de rappeler le No. ci-dessous.

No. ———

APPENDIX, No. 4.

PAPER handed in by Mr. *R. Bannister*, 25 July 1894.

EXTRACT from the Adjourned Discussion on the REPORT of the MILK COMMITTEE—"Analyst" 1886. Vol. xi., pp. 62, 63.

Number.	Adams' Extraction.		Soxhlet Extraction. Vieth.	Number.	Adams' Extraction.		Soxhlet Extraction. Vieth.
	Vieth.	Hehner.			Vieth.	Hehner.	
1	·25	·27	·21	13	3·57	3·65	3·37
2	·24	·47	·22	14	3·62	3·58	3·48
3	·31	·54	·24	15	4·02	4·04	3·70
4	·37	·56	·28	16	4·05	3·87	3·83
5	·31	·52	·32	17	3·90	4·23	3·84
6	·38	·54	·36	18	4·45	4·46	4·37
7	1·90	2·12	1·83	19	5·87	5·94	5·51
8	1·92	2·08	1·85	20	7·12	7·12	6·88
9	2·31	2·29	1·96	21	7·19	7·67	7·29
10	—	2·61	2·31	22	—	7·38	7·33
11	3·46	3·72	3·32	23	8·04	8·12	7·79
12	3·74	3·82	3·36	24	8·21	8·36	7·97

Differences in work of Nine Analysts and Dr. Vieth, when examining two samples of Milk in 1885. One rich, the other poor in fat. Adams' process.

	Total Solids.		Fat.		Solids not Fat.	
	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.
Rich milk	15·07	14·76	6·71	6·20	8·62	8·08
Difference	·31		·51		·54	
Poor milk	9·87	9·43	·83	·29	8·95	8·14
Difference	·44		·54		·81	

Difference in Rich Milk. Solids not Fat = ·54 = 6 per cent. water.
Fat = ·51 = 16 per cent. abstract at 3 per cent.

Poor Milk. Solids not Fat = ·81 = 95 per cent. water.
Fat = ·54 = 18 per cent. abstract at 3 per cent.

EXTRACT from the Adjourned Discussion on the Report of the Milk Committee, &c.—*continued.*

Number.	Vieth.	Hehner.	Difference.	Number.	Vieth.	Hehner.	Difference.	REMARKS.
1	·36	·34	·02	32	3·70	3·11	·59	Out of 61 samples examined, in 48 cases the difference between us was within ·1 per cent.; in six it was above 1 per cent. and below 2 per cent.; in five cases it was between ·2 and ·3 per cent.; whilst in one case we had a difference of ·59, and in another 1·48 per cent.; in this, of course there must be a blunder somewhere.
2	·43	·42	·01	33	3·70	3·81	·11	
3	·48	·51	·03	34	3·72	3·77	·05	
4	·76	·68	·08	35	3·73	3·74	·01	
5	·77	·68	·09	36	3·76	3·76	·00	
6	·83	·83	·00	37	3·77	3·79	·02	
7	1·16	1·08	·08	38	3·77	3·75	·02	
8	1·30	1·24	·06	39	3·78	3·78	·00	
9	2·01	1·99	·02	40	3·78	3·86	·08	
10	3·34	3·37	·03	41	3·84	3·81	·03	
11	3·36	3·28	·08	42	4·03	4·13	·10	
12	3·43	3·41	·02	43	4·17	4·19	·02	
13	3·44	3·51	·07	44	4·18	2·70	1·48	
14	3·45	3·28	·17	45	4·18	4·11	·07	
15	3·47	3·38	·09	46	4·19	4·04	·15	
16	3·49	3·57	·08	47	4·19	4·21	·02	
17	3·50	3·43	·07	48	4·25	4·21	·04	
18	3·52	3·47	·05	49	4·27	4·25	·02	
19	3·53	3·52	·01	50	4·33	4·33	·00	
20	3·57	3·28	·29	51	4·41	4·44	·03	
21	3·57	3·64	·07	52	4·44	4·72	·28	
22	3·57	3·47	·10	53	4·61	4·74	·13	
23	3·59	3·66	·07	54	4·66	4·71	·05	
24	3·59	3·36	·23	55	4·69	4·74	·05	
25	3·59	3·48	·11	56	5·58	5·49	·09	
26	3·61	3·59	·02	57	5·72	5·72	·00	
27	3·61	3·51	·10	58	5·86	5·85	·01	
28	3·62	3·50	·12	59	11·47	11·26	·21	
29	3·62	3·57	·05	60	24·31	24·26	·04	
30	3·65	3·59	·06	61	36·60	36·88	·28	
31	3·69	3·65	·04					

APPENDIX, No. 5.

PAPER handed in by the *Chairman*, 1 August 1894.

IT has come to the knowledge of the directors of the Aylesbury Dairy Company, Limited, that certain persons interested in the dealing in milk, have drafted a Bill for the amendment of the "Sale of Food and Drugs Act," in which they seek to fix a standard of 2·5 per cent. of fat and 8·5 per cent. of solids not fat as the legal standard for pure milk.

The records of analyses made in the Laboratory of the Aylesbury Dairy Company have been searched with a view of discovering a justification for such a proceeding. These records since the year 1881 contain a total number of 248,484 analyses of milk, of which 154,815 have been of milk as received from the producers, that is the milk of a number of cows mixed together, or "mixed" milk, 6,462 of milk of single cows, and the remainder of samples of milk taken before, during, and after delivery to the company's customers in London.

The average monthly composition of milk for the past thirteen years and six months is given in Table I., from which it will be seen that the quality has been such that the milk would have borne an addition of two-thirds of its bulk of separated milk, *i.e.*, milk from which the cream has been extracted by means of a centrifugal cream separator, without bringing the percentage of fat below the standard of 2·5 per cent. now proposed, or, in other words, an average adulteration of 60 per cent. would be legalised by the passing into law of the Draft Bill.

It is argued that, though the average quality of "mixed" milk is such as given in Table I., the variations of milk from individual cows are large, some milk being well above the average, and other falling markedly below, and that therefore a low standard must be fixed; the standard of 2·5 has on this account been arbitrarily chosen. On this point, the Aylesbury Dairy Company can offer the evidence of 6,462 analyses of milk from individual cows of different breeds (Table II.), probably the most complete series extant, and certainly far larger than any hitherto published. In this it is seen that the amount of fat in milk of single cows varies between 10·5 and 1·1; it follows, therefore, that a standard of 2·5 per cent. would not always cover the lowest quality milk yielded by a cow.

In Table III. are given the highest and lowest percentages of fat in the milk delivered to the Aylesbury Dairy Company's customers on each day, from the 1st of January 1890, to the 30th of June 1894; a study of this will reveal the fact that, not only has no milk been delivered with less than 3·0 per cent. of fat, but that in certain months of the year (autumn and winter) this figure has never been touched, indicating that commercially not only is there no real justification for a lower standard than 3·0, but that it should be raised in the autumn and winter.

It has also been pleaded that a low standard is necessary in order to prevent innocent milk vendors from being convicted on account of circumstances beyond their control, *i.e.*, the rising of cream by natural force in the milk during delivery, and in hot weather its churning into butter; about 10,000 experiments have convinced the Aylesbury Dairy Company that, under ordinary circumstances, and in ordinary seasons, there is no great difficulty in delivering milk of ordinary average quality, so that every portion to the last drop shall contain the same amount of fat to 0·1 per cent., even in the hottest weather. Moreover, it is submitted that, it is not necessary to take this into consideration in fixing a standard, as every such case, should it be proved to occur, would be considered on its merits by the magistrate.

The Aylesbury Dairy Company have, perhaps, an unique right to speak in this matter, as their collection of analyses of milk made by their own chemists (who are recognised as authorities by the profession, and to whom the bulk of English literature on the chemistry of milk is due) is probably unequalled.

The directors of the Aylesbury Dairy Company would therefore submit that a standard of 2·5 per cent. would be a legal farce, and would permit of flagrant adulteration; and that seeing there are natural variations in quality from month to month, it would be unwise to fix any standard which might, in the interests of justice, require either to be lowered or raised according to circumstances; a standard fixed by Act of Parliament could not be so altered.

The standard for solids not fat proposed in the Draft Bill, 8·5 per cent. is the same as the limit now adopted by the Society of Public Analysts, and there seems to be little dispute as to its being reasonable.

In one respect, however, it might cause manifest injustice; it is well known that when cream is in excess in a milk that the solids not fat are thereby depressed, indeed in cream itself there is only about half the percentage of solids not fat that occurs naturally in milk; cases have occurred that very rich milk has been sold in which the solids not fat have been below 8·5 per cent., solely on account of the presence of a large percentage of cream, and were a legal standard of 8·5 per cent. to be fixed milk of great richness would be inevitably condemned, and could not be sold; it is true that by the addition of separated milk (which contains larger quantities of solids not fat than milk) the quality of such milk could be brought above the legal standard, but the ostensible object of the Draft Bill is not the legalising of such addition, and in this case the fixing of a standard of 2·5 per cent. would also favour instead of prevent adulteration.

Take for instance, as an example, average pure milk taken from a number of cows and mixed together, contains say, 3·9 per cent. of fat, and 8·8 per cent. of solids not fat; separated milk contains 0·25 per cent. of fat, and 9·2 per cent. of solids not fat; cream contains, say, 50 per cent. of fat, and 4·7 per cent. of solids not fat.

Now by taking—

		Fat.	Solids not Fat.
10 parts of pure "mixed" milk		39·0	88·0
6 parts of separated milk		1·5	55·2
we get 16 parts of "standard" milk	(16)	40·5	143·2
Containing		2·53% fat	8·95% solids not fat.

Showing that an addition of 60 per cent. of separated milk to "mixed" milk would masquerade as "genuine," were the proposed limits adopted.

		Fat.	Solids not Fat.
Again—10 parts of "mixed" milk		39·0	88·0
1 part of cream		50·0	4·7
we get 11 parts of rich milk	(11)	89·0	92·7
Containing		8·09% fat	8·43% solids not fat.

A very rich milk, which would fail to pass the standard.

To take the case of milk somewhat low in solids not fat, but which has been shown over and over again to exist, say—

Fat 4·50, and solids not fat 8·40,

this would not pass the standard. Add to two parts of this milk one part of separated milk—

		Fat.	Solids not Fat.
2 parts of pure milk		9·0	16·8
1 part of separated milk		0·25	9·2
3 parts mixture	(3)	9·25	26·0
Containing		3·08% Fat	8·67% solids not fat;

which would pass the standards as perfectly genuine milk.

The directors of the Aylesbury Dairy Company submit, therefore, that it is undesirable that a "standard" should be fixed by Act of Parliament, or if it is decided by the Committee of the House of Commons that a standard should be fixed, that it be not less, but rather higher, than that now adopted by the Society of Public Analysts, and most certainly the method of analysis should be specified.

The public, the farmer, and the honest retailer, suffer much more damage from the addition of "skim" or "separated" milk, to the pure article than they are at all likely to suffer from a high standard.

TABLE I.

	—	Specific Gravity.	Total Solids.	Fat.	Solids not Fat.
1881	January	1·0317	12·82	4·08	8·74
	February	1·0315	12·59	3·93	8·68
	March	1·0318	12·46	3·75	8·71
	April	1·0313	12·47	3·87	8·60
	May	1·0316	12·71	4·02	8·69
	June	1·0315	12·66	3·98	8·68
	July	1·0313	12·46	3·86	8·60
	August	1·0309	12·74	4·20	8·54
	September	1·0312	13·05	4·40	8·65
	October	1·0318	13·18	4·37	8·81
	November	1·0316	13·38	4·59	8·79
	December	1·0316	13·09	4 34	8·75
	Yearly Average	1·0315	12·80	4·12	8·68
1882	January	1·0317	12·89	4·15	8·74
	February	1·0320	12·76	3·96	8·80
	March	1·0320	12·73	3·94	8·79
	April	1·0320	12·96	4·13	8·83
	May	1·0321	12·95	4·11	8·84
	June	1·0317	12·96	4·21	8·75
	July	1·0316	12·99	4·26	8·73
	August	1·0315	13·04	4·32	8·72
	September	1·0319	13·12	4·30	8·82
	October	1·0321	13·36	4·46	8·90
	November	1·0321	13·40	4·49	8·91
	December	1·0319	13·14	4·33	8·81
	Yearly Average	1·0319	13·03	4·22	8·81
1883	January	1·0320	12·94	4·13	8·81
	February	1·0320	12·89	4·08	8·81
	March	1·0319	12·83	4·07	8·76
	April	1·0320	12·69	3·91	8·78
	May	1·0322	12·74	3·91	8·78
	June	1·0324	12·67	3·80	8·87
	July	1·0320	12·77	3·97	8·80
	August	1·0319	12·91	4·17	8·74
	September	1·0326	13.19	4·21	8·98
	October	1·0329	13·34	4·27	9·07
	November	1·0326	13·41	4·39	9·02
	December	1·0325	13·20	4·24	8·96
	Yearly Average	1·0323	12·97	4·10	8·87
1884	January	1·0325	12·89	3·97	8·92
	February	1·0325	12·77	3·87	8·90
	March	1·0323	12·72	3·86	8·86
	April	1·0323	12·65	3·82	8·83
	May	1·0324	12·64	3·78	8·86
	June	1·0323	12·50	3·67	8·83
	July	1·0319	12·60	3·85	8·75
	August	1·0318	12·95	4·17	8·78
	September	1·0321	13·28	4·39	8.89
	October	1·0324	13·53	4·54	8·99
	November	1·0324	13·65	4·64	9·01
	December	1·0326	13·39	4·38	9·01
	Yearly Average	1·0323	12·96	4·08	8·88

	—	Specific Gravity.	Total Solids.	Fat.	Solids not Fat.
1885	January	1·0324	13·22	4·28	8·94
	February	1·0323	13·02	4·12	8·90
	March	1·0325	12·86	3·94	8·92
	April	1·0323	12·74	3·89	8·85
	May	1·0324	12·90	4·00	8·90
	June	1·0323	12·88	4·01	8·87
	July	1·0319	12·94	4·14	8·80
	August	13·315	13·07	4·34	8·73
	September	1·0317	13·25	4·45	8·80
	October	10,323	13·41	4·45	8·96
	November	1·0322	13·31	4·39	8·92
	December	1·0322	13·12	4·23	8·89
	Yearly Average	1·0322	13·06	4·19	8·87
1886	January	1·0322	12·87	4·02	8·85
	February	1·0322	12·83	3·99	8·84
	March	1·0323	12·78	3·92	8·86
	April	1·0321	12·75	3·93	8·82
	May	1·0323	12·80	3·93	8·87
	June	1·0323	12·78	3·94	8·84
	July	1·0318	12·67	3·93	8·74
	August	1·0319	12·77	4·00	8·77
	September	1·0321	12·98	4·14	8·84
	October	1·0321	13·26	4·37	8·89
	November	1·0322	13·32	4·40	8·92
	December	1·0324	13·27	4·32	8·95
	Yearly Average	1·0322	12·92	4·07	8·85
1887	January	1·0324	12·91	4·02	8·89
	February	1·0324	12·90	4·01	8·89
	March	1·0325	12·86	3·94	8·92
	April	1·0323	12·71	3·87	8·84
	May	1·0324	12·81	3·98	8·83
	June	1·0323	12·82	3·95	8·87
	July	1·0318	12·64	3·92	8·72
	August	1·0315	13·82	4·13	8·69
	September	1·0318	13·19	4·38	8·81
	October	1·0324	13·21	4·27	8·94
	November	1·0325	13·24	4·28	8·96
	December	1·0325	13·10	4·15	8·95
	Yearly Average	1·0322	12·94	4·07	8·87
1888	January	1·0325	12·97	4·03	8·94
	February	1·0325	13·00	4·06	8·94
	March	1 0325	12·90	3·98	8·92
	April	1·0324	12·81	3·92	8·89
	May	1·0324	12·81	3·93	8·89
	June	1·0324	12·83	3·94	8·89
	July	1·0320	12·82	4·02	8·80
	August	1·0319	12·84	4·06	8·78
	September	1·0322	13·06	4·18	8·88
	October	1·0325	13·09	4·14	8·95
	November	1·0322	13·18	4·28	8·90
	December	1·0321	13·01	4·16	8·85
	Yearly Average	1·0323	12·94	4·06	8·88

TABLE I.—*continued.*

		Specific Gravity.	Total Solids.	Fat.	Solids not Fat.
1889	January	1·0320	12·79	3·99	8·80
	February	1·0321	12·76	3·95	8·81
	March	1·0319	12·73	3·97	8·76
	April	1·0319	12·68	3·92	8·76
	May	1·0322	12·67	3·84	8·83
	June	1·0322	12·55	3·74	8·81
	July	1·0319	12·65	3·90	8·75
	August	1·0320	12·77	3·97	8·80
	September	1·0321	12·91	4·07	8·84
	October	1·0323	13·21	4·29	8·92
	November	1·0321	13·19	4·31	8·88
	December	1·0322	13·02	4·14	8·88
	Yearly Average	1·0321	12·83	4·01	8·82
1890	January	1·0323	12·91	4.06	8·85
	February	1·0324	12·84	3·95	8·89
	March	1·0323	12·76	3·91	8·85
	April	1·0322	12·66	3·83	8·83
	May	1·0324	12·63	3·77	8·86
	June	1·0323	12·64	3·80	8·84
	July	1·0320	12·81	4·01	8·80
	August	1·0319	12·86	4·07	8·79
	September	1·0319	12·81	4·03	8·78
	October	1·0322	13·04	4·16	8·88
	November	1·0321	13·07	4·22	8·85
	December	1.0322	13·02	4·14	8·88
	Yearly Average	1.0322	12·84	4·00	8·84
1891	January	1·0321	12·86	4·02	8·84
	February	1·0322	12·54	3·73	8·81
	March	1·0323	12·62	3·78	8·84
	April	1·0323	12·56	3·73	8·83
	May	1·0324	12·58	3·73	8·85
	June	1·0325	12·42	3·55	8·87
	July	1·0321	12·55	3·74	8·81
	August	1·0320	12·70	3·90	8·80
	September	1·0322	12·93	4·05	8·88
	October	1·0323	13·17	4·22	8·95
	November	1·0321	13·21	4·30	8·91
	December	1·0321	13·02	4·15	8·87
	Yearly Average	1·0322	12·76	3·91	8·85
1892	January	1·0322	12·91	4·02	8·89
	February	1·0322	12·84	3·95	8·89
	March	1·0322	12·74	3·88	8·86
	April	1·0322	12·54	3·72	8·82
	May	1·0323	12·54	3·70	8·84
	June	1·0322	12·42	3·62	8·80
	July	1·0316	12·47	3·74	8·73
	August	1·0315	12·57	3·89	8·68
	September	1·0316	12·71	4·00	8·71
	October	1·0318	12·94	4·15	8·79
	November	1·0318	13·03	4·23	8·80
	December	1·0318	12·80	4·02	8·78
	Yearly Average	1·0320	12·71	3·91	8·80
1893	January	1·0321	12·68	3·85	8·83
	February	1·0321	12·58	3·76	8·82
	March	1·0320	12·52	3·73	8·79
	April	1·0319	12·53	3·75	8·78
	May	1·0319	12·46	3·70	8·76
	June	1·0316	12·37	3·70	8·67
	July	1·0311	12·41	3·83	8·58
	August	1·0314	12·54	3·89	8·65
	September	1·0316	12·80	4·06	8·74
	October	1·0317	13·20	4·39	8·81
	November	1·0321	13·09	4·21	8·88
	December	1·0321	12·94	4·08	8·86
	Yearly Average	1·0318	12·68	3·91	8·77
1894	January	1·0322	12·84	3·98	8·86
	February	1·0322	12·66	3·82	8·84
	March	1·0322	12·57	3·74	8·83
	April	1·0320	12·52	3·75	8·77
	May	1·0323	12·47	3·66	8·81
	June	1·0323	12·48	3·68	8·80

I hereby certify that the above Table correctly represents the average quality of Milk received by the Aylesbury Dairy Company since 1881, and is an abstract of the results of 154,815 analyses, according to the methods of analysis described in Appendix, recorded in the books of the Company's Laboratory. The above monthly averages are obtained by adding together the averages from each farm, and dividing the sum by the number of farms.

H. Droop Richmond, F.C.S., F.I.C., &c.

TABLE I.—*continued.*

		Specific Gravity.	Total Solids.	Fat.	Solids, not Fat.
1889	January	1·0320	12·79	3·99	8·80
	February	1·0321	12·76	3·95	8·81
	March	1·0319	12·73	3·97	8·76
	April	1·0319	12·68	3·92	8·76
	May	1·0322	12·67	3·84	8·83
	June	1·0322	12·55	3·74	8·81
	July	1·0319	12·65	3·90	8·75
	August	1·0320	12·77	3·97	8·80
	September	1·0321	12·91	4·07	8·84
	October	1·0323	13·21	4·29	8·92
	November	1·0321	13·19	4·31	8·88
	December	1·0322	13·02	4·14	8·88
	Yearly Average	1·0321	12·83	4·01	8·82
1890	January	1·0323	12·91	4·06	8·85
	February	1·0324	12·84	3·95	8·89
	March	1·0323	12·76	3·91	8·85
	April	1·0322	12·66	3·83	8 83
	May	1·0324	12·63	3·77	8·86
	June	1·0323	12·64	3·80	8·84
	July	1·0320	12·81	4·01	8·80
	August	1·0319	12·86	4·07	8·79
	September	1·0319	12 81	4·03	8·78
	October	1 0322	13·04	4·16	8·88
	November	1·0321	13·07	4·22	8·85
	December	1·0322	13·02	4 14	8·88
	Yearly Average	1·0322	12·84	4·00	8 84
1891	January	1·0321	12·86	4·02	8·84
	February	1·0322	12·54	3·73	8·81
	March	1·0323	12·62	3·78	8·84
	April	1·0323	12·56	3·73	8·83
	May	1·0324	12·58	3·73	8·85
	June	1·0325	12·42	3·55	8·87
	July	1·0321	12·55	3·74	8·81
	August	1·0320	12·70	3·90	8·80
	September	1·0322	12·93	4·05	8·88
	October	1·0323	13·17	4·22	8·95
	November	1·0321	13·21	4·30	8·91
	December	1·0321	13·02	4·15	8·87
	Yearly Average	1·0322	12·76	3·91	8·85
1892	January	1·0322	12·91	4·02	8 89
	February	1·0322	12·84	3·95	8·89
	March	1·0322	12·74	3·88	8·86
	April	1·0322	12·54	3·72	8·82
	May	1·0323	12·54	3·70	8·84
	June	1·0322	12·42	3·62	8·80
	July	1·0316	12·47	3·74	8·73
	August	1·0315	12·57	3·89	8·68
	September	1·0316	12·71	4·00	8·71
	October	1·0318	12·94	4·15	8·79
	November	1·0318	13·03	4·23	8·80
	December	1·0318	12·80	4·02	8·78
	Yearly Average	1 0320	12·71	3·91	8·80
1893	January	1·0321	12·68	3·85	8·83
	February	1·0321	12·58	3·76	8·82
	March	1·0320	12·52	3·73	8·79
	April	1·0319	12·53	3·75	8·78
	May	1·0319	12·46	3·70	8·76
	June	1·0316	12·37	3·70	8·67
	July	1·0311	12·41	3·83	8·58
	August	1·0314	12·54	3·89	8·65
	September	1·0316	12·80	4·06	8·74
	October	1·0317	13·20	4·39	8·81
	November	1·0321	13·09	4·21	8·88
	December	1·0321	12·94	4·08	8·86
	Yearly Average	1·0318	12·68	3·91	8·77
1894	January	1·0322	12·84	3·98	8·86
	February	1·0322	12·66	3 82	8·84
	March	1·0322	12·57	3·74	8·83
	April	1·0320	12·52	3·75	8·77
	May	1·0323	12·47	3·66	8·81
	June	1·0323	12·48	3 68	8·80

I hereby certify that the above Table correctly represents the average quality of Milk received by the Aylesbury Dairy Company since 1881, and is an abstract of the results of 154,815 analyses, according to the methods of analysis described in Appendix, recorded in the books of the Company's Laboratory. The above monthly averages are obtained by adding together the averages from each farm, and dividing the sum by the number of farms.

H. Droop Richmond, F.C.S., F.I.C., &c.

TABLE II.

PERCENTAGE of Fat in the Milk of Single Cows.

Percentage of Fat.	Dairy Shn.	Pedigree Shn.	Kerry.	Jersey.	Sussex.	Montgomery.	Welsh.	Red Polled.
		Number of Samples containing the amount of Fat given in First Column						
10·5	—	—	1	—	—	—	—	—
10·3	—	—	1	—	—	—	—	—
10·2	1	—	—	—	—	—	—	—
9·8	—	—	—	1	—	—	—	—
9·7	1	—	—	—	—	—	—	—
9·6	1	—	1	—	—	—	—	—
9·5	1	—	—	1	—	—	—	—
9·4	—	—	1	—	—	—	—	—
9·1	1	—	—	—	—	—	—	—
8·8	1	—	—	—	—	—	—	—
8·7	1	—	1	1	—	—	—	—
8·6	—	—	—	1	—	—	—	—
8·5	1	—	1	1	—	—	—	—
8·3	1	—	—	2	—	—	1	—
8·2	—	—	2	2	—	—	—	—
8·0	1	—	—	2	—	—	—	—
7·9	—	—	1	—	—	—	—	—
7·8	1	—	—	3	—	—	—	—
7·7	—	—	2	1	—	—	—	—
7·6	—	—	—	2	1	—	—	—
7·5	3	1	1	1	—	—	—	—
7·4	—	—	—	3	2	—	—	—
7 3	—	—	3	9	—	—	—	—
7·2	4	—	3	4	1	—	—	—
7·1	3	—	5	6	—	—	—	—
7 0	—	2	2	7	—	—	—	—
6·9	1	1	5	12	1	—	—	—
6·8	9	1	3	5	—	—	—	—
6·7	7	1	6	10	2	—	—	—
6 6	6	—	8	6	1	—	1	1
6.5	2	—	12	15	3	1	—	—
6·4	6	3	14	9	2	—	2	—
6·3	3	—	13	11	3	—	—	1
6·2	14	—	9	11	1	—	—	—
6·1	14	1	19	14	1	1	1	2
6·0	14	1	22	20	1	—	—	2
5·9	11	—	25	15	4	—	—	—
5·8	15	1	36	18	—	1	—	1
5·7	15	4	29	5	4	—	—	3
5·6	25	2	34	12	3	—	—	2
5·5	38	16	43	16	4	—	—	3
5·4	47	8	35	11	2	1	—	8
5·3	46	13	48	13	5	—	—	5
5·2	62	14	50	18	4	1	2	9
5·1	48	8	51	12	5	1	—	5
5·0	75	25	57	16	5	2	1	5
4·9	83	16	68	16	2	1	—	6
4·8	95	36	63	11	6	2	1	13
4·7	115	39	65	13	2	2	—	7
4·6	108	49	56	9	8	—	—	3
4·5	117	48	59	11	4	1	2	8
4·4	147	70	84	6	10	3	1	9
4·3	166	76	65	4	4	1	—	5
4·2	134	77	64	7	8	—	—	5
4·1	179	98	72	6	4	—	1	7
4·0	169	85	63	6	2	5	—	7
3·9	156	84	40	2	7	2	—	7
3·8	144	88	43	5	3	5	—	8
3·7	131	67	39	2	2	8	1	6
3·6	107	75	40	2	1	5	1	3
3·5	87	48	20	3	3	4	1	7
3·4	81	60	36	—	3	4	—	5
3·3	69	39	14	1	1	3	—	8
3·2	55	30	12	1	1	4	—	4
3·1	63	25	12	1	3	6	1	5
3·0	41	19	10	—	2	5	1	4

TABLE II.—Percentage of Fat in the Milk of Single Cows—*continued.*

Percentage of Fat.	Dairy Shn.	Pedigree Shn.	Kerry.	Jersey.	Sussex.	Montgomery.	Welsh.	Red polled.
2·9	28	15	6	—	1	3	—	6
2·8	25	15	7	—	—	5	—	1
2·7	21	8	7	—	—	3	—	2
2·6	16	10	2	—	—	1	—	2
2·5	5	5	1	—	—	—	—	1
2·4	8	5	—	1	—	1	—	—
2·3	5	1	—	—	—	2	—	—
2·2	2	—	—	—	—	1	—	—
2·1	5	1	—	—	—	1	—	—
2·0	2	—	—	1	—	—	—	—
1·9	2	1	—	—	—	—	—	—
1·8	—	—	1	—	—	—	—	—
1·7	—	—	—	—	—	1	—	—
1·6	1	—	—	—	—	—	—	—
1·4	—	—	—	—	—	1	—	—
1·3	1	—	—	—	—	—	—	—
1·1	1	—	—	—	—	—	—	—
TOTAL NUMBER	2,849	1,292	1,493	404	132	88	18	186

SYNOPSIS.

	Number of Samples.	Max.	Min.	Average.
Dairy Shorthorns	2,849	10·2	1·1	4·03
Pedigree Shorthorns	1,292	7·5	1·9	4·03
Kerrys	1,493	10·5	1·8	4·72
Jerseys	404	9·8	2·0	5·66
Sussex	132	7·6	2·9	4·87
Montgomerys	88	6·5	1·4	3·59
Welsh	18	8·3	3·0	4·91
Red Polled	186	6·6	2·5	4·34
All Breeds	6,462	10·5	1·1	—

I hereby certify that the above Table correctly represents the amount of fat in the milk of single cows, as shown by 6,462 analyses made according to the methods described in the Appendix, and recorded in the books of the Company's Laboratory.

H. Droop-Richmond, F.C.S., F.I.C., &c.

TABLE III *a*.

TABLE showing the Highest and Lowest Percentage of Fat in Milk sent out on each Day in the Year 1890.

	January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1	4·2	3·6	4·2	3·6	4·2	3·7	4·1	3·0	4·1	3·5	–	–	4·4	3·5	4·4	3·7	4·6	4·0	4·4	3·9	4·3	3·6	4·5	3·7
2	4·3	3·6	–	–	–	–	4·0	3·3	4·0	3·6	3·9	3·2	4·4	3·5	4·2	3·6	4·4	3·9	4·3	4·0	–	–	4·4	3·5
3	4·3	3·8	4·2	3·6	4·3	3·7	–	–	4·1	3·2	4·0	3·3	4·4	3·6	–	–	4·3	4·1	4·5	3·8	4·7	3·9	4·2	3·6
4	4·2	3·7	4·4	3·6	4·3	3·6	–	–	–	–	3·9	3·2	3·9	3·6	–	–	4·3	3·9	4·4	3·8	4·6	3·8	4·2	3·5
5	–	–	4·3	3·5	4·2	3·6	4·1	3·6	4·2	3·5	3·9	3·1	4·2	3·7	4·2	3·8	3·9	3·8	–	–	4·2	3·7	4·4	3·7
6	4·2	3·5	4·1	3·6	4·2	3·7	–	–	4·3	3·4	4·0	3·3	–	–	4·2	3·7	4·0	3·8	4·3	3·8	4·4	3·9	4·2	3·6
7	4·4	3·7	4·2	3·5	4·2	3·6	–	–	4·1	3·4	3·9	3·2	4·3	3·6	4·2	3·8	–	–	4·4	3·9	4·4	3·7	–	–
8	4·2	3·6	4·1	3·6	4·3	3·5	4·1	3·1	4·1	3·3	–	–	4·3	3·8	4·4	3·5	4·0	3·4	4·2	3·7	4·3	3·6	4·2	3·6
9	4·4	3·8	–	–	–	–	4·0	3·1	4·0	3·3	3·9	3·1	4·2	3·5	4·3	3·3	4·3	3·8	4·5	4·0	–	–	4·4	3·6
10	4·3	3·7	3·9	3·5	4·3	3·6	3·8	3·1	4·3	3·2	4·2	3·4	4·1	3·4	–	–	4·3	3·8	4·2	3·8	4·4	3·7	4·4	3·7
11	4·3	3·8	4·0	3·6	4·3	3·8	4·3	3·6	–	–	3·9	3·2	4·2	3·6	4·2	3·4	4·0	3·8	4·4	3·8	4·6	3·8	4·4	3·6
12	–	–	4·2	3·6	4·2	3·8	4·1	3·4	3·8	3·2	4·1	3·4	4·4	3·7	4·5	3·8	4·1	3·7	–	–	4·2	3·7	4·3	3·7
13	4·1	3·6	4·3	3·6	4·1	3·5	–	–	4·0	3·2	4·0	3·3	–	–	4·3	3·7	4·1	3·8	4·3	3·7	4·6	3·8	4·3	3·6
14	4·4	3·7	4·2	3·4	4·1	3·4	4·0	3·3	4·0	3·3	4·1	3·3	4·3	3·4	4·2	3·8	–	–	4·3	3·8	4·2	3·7	–	–
15	4·3	3·6	4·2	3·6	4·2	3·4	4·1	3·4	4·2	3·3	–	–	4·6	3·4	4·3	3·7	4·2	3·8	4·2	3·9	4·2	3·6	4·5	3·6
16	4·2	3·6	–	–	–	–	4·1	3·1	4·1	3·2	3·8	3·2	4·2	3·8	4·5	3·8	4·1	3·9	4·2	3·9	–	–	4·7	3·7
17	4·5	3·6	4·2	3·6	4·0	3·5	3·9	3·2	4·2	3·2	4·2	3·4	4·3	3·8	–	–	4·5	4·1	4·3	3·9	4·5	3·8	4·3	3·8
18	4·1	3·7	4·2	3·4	4·1	3·3	4·1	3·6	–	–	4·0	3·3	3·9	3·4	4·2	3·7	4·6	4·0	4·4	3·8	4·4	3·6	4·6	3·8
19	–	–	4·2	3·5	4·2	3·6	4·1	3·4	4·0	3·3	4·0	3·3	4·4	3·7	4·4	3·8	4·5	4·0	–	–	4·3	3·8	4·4	3·7
20	4·3	3·5	4·0	3·5	4·3	3·3	–	–	4·0	3·3	4·1	3·5	–	–	4·4	3·5	4·6	3·8	4·4	3·8	4·3	3·8	4·4	3·8
21	4·3	3·6	4·1	3·4	4·3	3·4	4·1	3·3	4·2	3·5	4·1	3·5	4·3	3·6	4·5	3·9	–	–	4·5	3·8	4·5	3·7	–	–
22	4·3	3·6	4·3	3·4	4·1	3·4	4·4	3·1	4·1	3·5	–	–	4·4	3·7	4·4	3·8	4·2	3·8	4·3	3·8	4·5	3·8	4·5	3·6
23	4·3	3·6	–	–	–	–	4·0	3·5	3·9	3·1	4·1	3·5	4·2	3·6	4·5	4·0	4·4	3·8	4·4	3·7	–	–	4·4	3·9
24	4·2	3·7	4·2	3·4	4·0	3·4	4·1	3·3	4·1	3·3	4·1	3·5	4·2	3·7	–	–	4·4	3·8	4·4	3·9	4·5	3·6	4·2	3·7
25	4·3	3·6	4·3	3·5	4·2	3·4	4·0	3·4	–	–	4·1	3·5	4·1	3·8	4·3	3·6	4·4	3·7	4·3	3·8	4·3	3·8	–	–
26	–	–	4·3	3·6	4·0	3·4	4·2	3·3	–	–	4·2	3·5	4·2	3·7	4·3	3·6	4·2	3·9	–	–	4·4	3·8	–	–
27	4·2	3·6	4·2	3·6	4·1	3·3	–	–	4·4	3·4	4·2	3·4	–	–	4·4	3·9	4·3	3·8	4·4	3·9	4·5	3·9	4·4	3·5
28	4·4	3·6	4·3	3·8	4·0	3·2	4·1	3·3	3·9	3·3	4·4	3·6	4·3	3·8	4·3	3·9	–	–	4·7	3·6	4·4	3·8	–	–
29	4·3	3·6	–	–	3·9	3·3	4·2	3·2	3·8	3·2	–	–	4·7	3·9	4·4	4·1	4·2	3·8	4·5	3·8	4·6	3·7	4·2	3·6
30	4·4	3·6	–	–	–	–	4·1	3·3	4·0	3·4	4·2	3·5	4·4	3·8	4·3	4·0	4·3	3·8	4·3	3·8	–	–	4·3	3·7
31	4·2	3·6	–	–	3·9	3·4	–	–	3·9	3·3	–	–	4·3	3·7	–	–	–	–	4·4	3·8	–	–	4·3	3·8
Maximum during Month.	4·5	–	4.4	–	4·3	–	4·4	–	4·3	–	4·4	–	4·7	–	4·5	–	4·6	–	4·7	–	4·7	–	4·7	–
Minimum during Month.	–	3·5	–	3·4	–	3·2	–	3·0	–	3·1	–	3·1	–	3·4	–	3·3	–	3·4	–	3·6	–	3·6	–	3·5

I hereby certify that the above Table contains the daily minimum and maximum amount of fat contained in the milk sent out during 1890, as determined according to the methods of analysis given in the Appendix, and recorded in the books of the Company's Laboratory.

H. Droop Richmond, F.C.S., F.I.C., &c.

TABLE III *b*.

TABLE showing the Highest and Lowest Percentage of Fat in Milk sent out on each Day in the Year 1891.

	January.		February.		March.		April.		May.		June.		July.		August,		September.		October.		November.		December.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1	4·4	3·7	–	–	–	–	4·0	3·6	3·	3·5	4·1	3·1	4·2	3·5	4·3	3·7	4·5	3·6	4·5	3·9	–	–	4·3	3·6
2	4·2	3·6	4·1	3·6	3·9	3·4	4·2	3·4	·3	3·6	4·1	3·3	4·1	3·5	–	–	4·3	3·8	4·3	3·8	4·6	3·8	4·4	3·8
3	4·3	3·6	4·1	3·5	4·0	3·5	4·3	3·6	4·3	–	4·0	3.3	4·2	3·5	–	–	4·2	3·6	4·6	3·8	4·5	3·7	4·4	3·8
4	–	–	4·2	3·5	4·1	3·4	4·1	3·5	4·2	3·4	3·9	3·4	4·0	3·5	4·3	3·8	4·2	3·8	–	–	4·5	4·0	4·4	3·6
5	4·3	3·6	3·9	3·3	4·1	3·4	–	–	4·6	3·4	4·2	3·5	–	–	4·1	3·6	4·2	3·7	4·3	3·77	4·7	3·9	4·2	3·6
6	4·6	3·6	3·9	3·5	4·1	3 4	3·9	3·4	4·3	3·5	4·0	3·3	4·0.	3·4	4·0	3·7	–	–	4·3	3·7	4·6	3·8	–	–
7	4·4	3·8	4·0	3·4	4·0	3 4	4·3	3·2	4·4	3·6	–	–	4·2	3·6	4·0	3·7	4·3	3·8	4·3	3·8	4·7	3·8	4·3	3·6
8	4·3	3·6	–	–	–	–	4·3	3·6	4·3	3·4	4·1	3·2	4·4	3·6	4·3	3·6	4·5	3·8	4·7	3·8	–	–	4·4	3·6
9	4·5	3·7	3·8	3·3	3·9	3·4	4·4	3·6	4·5	3·3	4·3	3·4	4·1	3·5	–	–	4·4	3·8	4·4	3·5	4·6	3·8	4·3	3·4
10	4·3	3·6	4·1	3·2	4·3	3·5	4·3	3·5	–	–	4·0	3·4	3·9	3·6	4·1	3·5	4·0	3·6	4·3	3·7	4·7	3·9	4·4	3·6
11	-	–	4·0	3·5	4·3	3·4	4·0	3·4	4·3	3·6	3·9	3·4	4·0	3·5	4·2	3·5	4·1	3·7	–	–	4·5	3·8	4 4	3·6
12	4·2	3·9	4·0	3·4	4·2	3·3	–	–	4·4	3·4	3·9	3·3	–	–	4·2	3·6	3·9	3·6	4·3	3·8	4·4	4·0	4·4	3·8
13	4·3	3·7	3·9	3 4	4·1	3·4	4·1	3·5	4·2	3·6	3·9	3·3	4·0	3·4	4·2	3·7	–	–	4·9	3·8	4·5	3·7	–	–
14	4·4	3·6	4·1	3·6	4·1	3·3	4·4	3·5	4·3	3·4	–	–	4·4	3·6	4·0	3·7	4·2	3·3	4·6	4·1	4·4	3·7	4·6	3·7
15	4·2	3·7	–	–	–	–	4·1	3·4	4·7	3·6	3·9	3·2	4·0	3·7	4·2	3·5	4·2	3·6	4·8	3·9	–	–	4·4	3·7
16	4·4	3·6	3·8	3·3	4·0	3·5	4·1	3·5	4·2	3·6	4·0	3·2	4·1	3·5	–	–	4·5	3·7	4·7	3·8	4·4	3·7	4·4	3·7
17	4·4	3·6	4·1	3·6	4·1	3·4	4·2	3·5	–	–	4·0	3·2	4·0	3·5	4·0	3·8	4·3	3·8	4·6	3·9	4·8	3·8	4·3	3·6
18	–	–	3·8	3·3	4·3	3·3	4·2	3·4	–	–	3·8	3·2	4·0	3·5	4·1	3·6	4·3	3·7	–	-	4·4	3·8	4·5	3·6
19	4·3	3·7	3·8	3·5	4·1	3·5	–	–	4·9	3·5	3·9	3·5	–	–	4·1	3·7	4·2	3·6	4·7	4·0	4·5	3·8	4·5	3·7
20	4·5	3·6	3·9	3·6	4·3	3·4	4·1	3·4	4·3	3·5	3·9	3·4	4·0	3·4	4·0	3·8	-	–	5·0	4·1	4·4	4·0	–	–
21	4·3	3·5	4·0	3·5	4·3	3·6	4·2	3·4	4·0	3·5	–	–	4·1	3·5	4·0	3·5	4·4	3·8	4·4	3 9	4·4	3·8	4·6	3·6
22	4·0	3·7	–	–	–	–	4·0	3·5	4·2	3·4	4·0	3·2	4·0	3·5	4·2	3·7	4·7	3·8	4·6	3·8	–	–	4·6	3·8
23	4·1	3·6	3·9	3·3	4·1	3·5	4·2	3·3	4·4	3·3	4·2	3·3	4·1	3·7	–	–	4·5	3·8	4·8	3·8	4·6	3·8	4·4	3·8
24	4·1	3·5	4·2	3·3	4·6	3·5	4·1	3·4	–	–	4·0	3·2	4·1	3·5	4·0	3·7	4·3	3·8	4·6	3·9	4·7	3·9	4·4	3·8
25		–	4·4	3·1	4·1	3·4	4·1	3·4	4·4	3·5·	4·1	3·3	4·0	3·6	4·1	3·8	4·6	3·8	–	–	4·4	3·8	–	–
26	4·3	3·6	4·3	3·3	4·1	3·2	–	–	4·9	3·3	3·8	3·2	–	–	4·4	3·8	4·4	3·7	4·4	3·6	4·4	3·9	–	–
27	4·2	3·3	4·0	3·3	–	–	4·2	3·6	4·2	3·4	4·1	3·4	4·1	3·4	4 5	3·7	–	–	4·6	3·9	4·4	3·8	–	–
28	4·1	3·6	4·0	3·1	4·3	3·7	4·6	3·3	4·2	3·3	–	–	4·1	3·8	4·3	3·7	4·3	3·6	4·7	3·9	4·3	3·8	4·1	3·8
29	4·0	3·5	–	–	–	–	4·1	3·4	4·3	3·4	4·0	3·4	4·1	3·6	4·2	3·8	4·5	3·9	4·7	3·8	–	–	4·2	3·5
30	3·9	3·5	–	–	–	–	4·3	3·3•	4·3	3·1	4·1	3·6	4·2	3·5	–	–	4·3	3·7	4·4	4·0	4·5	3·7	4·3	3·7
31	4·1	3·4	–	–	4·4	3·6	–	–	–	–	–	–	4·2	3·6	4·3	3·8	–	–	4·6	4·0	–	–	4·3	3·6
Maximum during Month	4·6	–	4·4	–	4·6·	–	4·6	–	4·9	–	4·3	–	4·4	–	4·4	–	4.7	–	5·0	–	4·8	–	4·6	–
Minimum during Month	–	3·3	–	3·1	–	3·2	–	3·2	–	3·1	–	3·2	–	3·4	–	3·5	–	3·3	–	3·5	–	3·7	–	3·4

I hereby certify that the above Table contains the daily minimum and maximum amount of fat contained in the milk sent out during 1891, as determined according to the methods of analysis given in the Appendix, and recorded in the books of the Company's Laboratory.

(signed) *H. Droop Richmond*, F.C.S., F.I.C., &c.

TABLE III *c*.

TABLE showing the Highest and Lowest Percentage of Fat in Milk sent out on each Day in the Year 1892.

	January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1	4·2	3·6	4·1	3·6	4·1	3·6	4·0	3·3	–	–	4·1	3·6	3·9	3·3	–	–	4·1	3·8	4·3	3·9	4·4	3·4	4·4	3·6
2	4·4	3·6	4·4	3·6	4·2	3·6	3·9	3·3	3·7	3·3	3·8	3·3	3·8	3·2	4·1	3·5	4·1	3·8	–	–	4·4	3·7	4·2	3·5
3	–	–	4·3	3·8	4·3	3·7	–	–	4·1	3·4	3·8	3·3	–	–	4·1	3·5	4·4	3·7	4·1	3·9	4·2	3·6	4·3	3·6
4	4.2	3·6	4·2	3·5	4·4	3·8	4·0	3·3	3·9	3·4	3·8	3·1	3·8	3·2	4·1	3·5	-	-	4·7	3·8	4·1	3·4	–	–
5	4·5	3·6	4·3	3·7	4·3	3·7	4·0	3·5	3·6	3·2	–	–	3·9	3·5	3·9	3·7	4·3	3·6	4·1	3·8	4·3	3·3	4·1	3·5
6	4·6	3·7	4·1	3·5	–	–	3·8	3·2	3·9	3·5	–	–	4·0	3·4	4·0	3·6	4·3	3·8	4·3	3·8		–	4·3	3·6
7	4·2	3·6	–	–	4·2	3·6	4·0	3·2	3·8	3·4	4·0	3·2	4·0	3·3	–	–	4·1	3·8	4·2	3·8	4·1	3·7	4·2	3·6
8	4·2	3·6	4·2	3 5	4·3	3·7	4·0	3·3	–	–	3·8	3·3	4·0	3·4	3·9	3·2	4·1	3·8	4·2	3·8	4·4	3·6	4·1	3·5
9	4·3	3·6	4·3	3·6	4·2	3·6	4·0	3·3	3·6	3·5	3·9	3·3	3·9	3·4	4·3	3·6	4·0	3·8	–	–	4·3	3·4	4·2	3·5
10	–	-	4·1	3·5	4·2	3·5	–	–	3·8	3·4	3·7	3·4	–	-	4·1	3·6	4·4	3·5	4·3	3·8	4·1	3·5	4·4	3·6
11	4·4	3·6	4·1	3·5	4·1	3·7	3·9	3·3	4·1	3·5	3·8	3·1	3·8	3·3	4·0	3·8	-	–	4·5	3·7	4·3	3·4	–	–
12	4·4	3·8	4·1	3·4	4·1	3·5	4·2	3·3	4·1	3·3	–		4·1	3·3	4·1	3·7	4·0	3·7	4·4	3·8	4·3	3·6	4·2	3·4
13	4·3	3·6	4·2	3·6	-	-	4·0	3·3	3·9	3·4	3·8	3·0	4·0	3·4	3·9	3·6	4·2	3·8	4·3	3·8	–	–	4·1	3·4
14	4·2	3·6	–	–	4·2	3·6	4·1	3·4	3·8	3·4	3·9	3·3	4·0	3·4	–	–	4·0	3·7	4·3	3·8	4·2	3·5	4·0	3·5
15	4·2	3·6	4·4	3·5	4·2	3·6	–	-	–	–	3·8	3·1	3·9	3·3	4·1	3·6	4.3	3·8	4·3	3·6	4·4	3·5	4·2	3·7
16	4·3	3·5	4·2	3·7	4·2	3·6	4·0	3·5	3·8	3·4	4·0	3·2	3·9	3·3	4·0	3·8	4·0	3·8	-	–	4·3	3·6	4·1	3·6
17	–	-	4·4	3·8	1·1	3·4	–	–	4·2	3·6	3·8	3·2	–	–	4·1	3·6	4·2	3·5	4 4	3·6	4·3	3·5	4·1	3·5
18	4·1	3·6	4·3	3·7	4·0	3·5	–	–	4·0	3·5	3·7	3·2	3·9	3·4	4·0	3·6	–	–	4·6	3·8	4·7	3·5	–	–
19	4·2	3·6	4·3	3·6	4·0	3·5	4·2	3·5	3·9	3·4	–	–	4·0	3·5	4·1	3·5	4·2	3·8	4·6	3·8	4·4	3·6	4·3	3·2
20	4·3	3·5	4·3	3·6	–	–	3·8	3·1	4·1	3·5	3·7	3·0	4·0	3·6	4·0	3·4	4·1	3·6	4·3	3·6	–		4·2	3·3
21	4·3	3·6	–	–	4·3	3·6	4·0	3·4	4·1	3·3	3·8	3·1	4·3	3·6	–	–	4·0	3·4	4·3	3·8	4·4	3·6	4·2	3·5
22	4·3	3·7	4·2	3·5	4·2	3·5	4·0	3·2	–	–	3·7	3·1	4·0	3·7	3·9	3·8	4·2	4·0	4·3	3·8	4·2	3·3	4·2	3·4
23	4·4	3·4	4·3	3·5	4·2	3·7	4·0	3·5	3·8	3·5	3·8	3·1	4·0	3·6	4·1	3·8	4·2	3·8	–	–	4·3	3·6	4·0	3·4
24	–	–	4·1	3·5	4·2	3·5	–	–	4·1	3·3	3·8	3·1	–	–	4·1	3·5	4·1	3·6	4·2	3·6	4·6	3·7	4·3	3·6
25	4·1	3·6	4·1	3·6	4·0	3·6	3·9	3·5	4·1	3·3	3·7	3·2	4·1	3·3	4·1	3·6	–	-	4·3	3·6	4·3	3·5	–	–
26	4·2	3·6	4·2	3·6	4·1	3·5	3·9	3·3	4·0	3·5	–	–	4·1	3·6	4·1	3·8	4·1	3·5	4·2	3·8	4·2	3·7	–	–
27	4·3	3·6	4·3	3·6	–	–	3·9	3·5	4·0	3·4	3·7	3·1	4·1	3·7	4·2	3·7	4·2	3·9	4·3	3·7	-	–	4·2	3·6
28	4·2	3·6	–	–	4·0	3·6	4·0	3·5	4·0	3·3	3·8	3·3	4·1	3·6	–	–	4·2	3·8	4·1	3·7	4·4	3·7	4·1	3·5
29	4·2	3·6	4·1	3·6	4·3	3·6	4·0	3·4	–	–	3·8	3·3	4·0	3·6	4·2	3·7	4·2	8	4·3	3·5	4·8	3·7	4·2	3·5
30	4·1	3·6	–	–	4·0	3·6	4·0	3·5	4·0	3·6	4·0	3·4	4·0	3·5	4·3	3·8	4·0	3·9	–	–	4·4	3·5	4·1	3·6
31	–	–	–	–	4·2	3·5	–	–	4·0	3·3	–	–	–	–	4·2	3·9	–	–	4·1	3·4	–	–	4·0	3·4
Maximum during Month	4·5	–	4·4	–	4·4	–	4·2	–	4·2	–	4·1	–	4·1	–	4·3	–	4·4	–	4·7	–	4·8	–	4·4	–
Minimum during Month	–	3·4	–	3·4	–	3·4	–	3·1	–	3·2	–	3·0	–	3·2	–	3·2	–	3·5	–	3·4	–	3·3	–	3·2

I hereby certify that the above Table contains the daily minimum and maximum amount of fat contained in the milk sent out during 1892, as determined according to the methods of analysis given in the Appendix, and recorded in the books of the Company's Laboratory.

(signed) *H. Droop Richmond*, F.C.S., F.I.C., &c.

TABLE III *d*.

TABLE showing the Highest and Lowest per-centage of Fat in Milk sent out on each Day in the the Year 1893.

	January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1	–	–	4·0	3·1	3·8	3·2	4·0	3·3	3·9	3·1	4·0	3·5	3·9	3·5	4·4	3·6	3·9	3·4	4·2	3·2	4·6	3·7	4·2	3·3
2	4·1	3·6	3·7	3·3	3·8	3·3	4·1	3·3	4·0	3·3	4·0	3·4	3·9	3·6	4·1	3·4	4·2	3·4	4·4	3·7	4·4	3·7	4·3	3·4
3	4·3	3·7	3·9	3·4	3·9	3·08	3·9	3·3	3·9	3·4	3·9	3·2	4·1	3·3	4·1	3·4	3·9	3·6	4·5	3·8	4·5	3·4	4·3	3·5
4	4·2	3·4	3·8	3·3	3·8	3·3	3·9	3·2	3·8	3.3	3·7	3·6	4·0	3·7	4·1	3·3	4·0	3·4	4·4	3·8	4·5	3·6	4·3	3·4
5	4·0	3·5	–	–	4·3	3·6	3·8	3·3	3·8	3·5	3·8	3·1	4·1	3·5	4·0	3·6	4·2	3·7	4·3	4·0	4·5	3·4	4·3	3·4
6	4·0	3·5	4·0	3·3	3·9	3·1	3·8	3·1	3·8	3·4	3·9	3·2	3·8	3·4	4·0	3·8	4·1	3·6	4·4	3·9	4·3	3·5	4·1	3·5
7	4·0	3·4	4·1	3·4	4·0	3·3	3·8	3·2	3·8	3·6	3·9	3·3	4·0	3·4	4·3	3·4	4·0	3·5	4·2	3·6	4·6	3·5	4·3	3·5
8	–	–	4·0	3·2	3·9	3·2	4·0	3·3	4·2	3·3	3·8	3·4	4·1	3·4	4·3	3·5	4·0	3·5	4·3	3·9	4·5	3·5	4·1	3·5
9	3·9	3·4	4·0	3·3	3·8	3·4	4·1	3·4	4·1	3·2	4·1	3·2	4·0	3·7	3·9	3·6	4·1	3·6	4·4	3·8	4·6	3·4	4·2	3·5
10	4·2	3·5	4·1	3·2	3·8	3·2	4·0	3·4	4·0	3·2	3·8	3·3	4·2	3·2	3·8	3·6	4·2	3·9	4·4	3·9	4·4	3·6	4·3	3·5
11	3·8	3·4	4·0	3·3	3·9	3·2	4·0	3·3	3·8	3·3	3·8	3·5	4·3	3·5	4·0	3·6	4·2	3·7	4·3	4·0	4·7	3·6	4·3	3·4
12	3·9	3·5	–	–	4·1	3·5	4·2	3·6	3·8	3·2	3·9	3·5	4·1	3·4	4·3	3·4	4·1	3·7	4·5	3·8	4·4	3·6	4·5	3·5
13	4·0	3·4	4·0	3·2	4·0	3·2	4.0	3·4	4·0	3·1	4·1	3·4	4·0	3·4	3·9	3·6	4·1	3·6	4·3	3·8	4·2	3·4	4·0	3·5
14	4·0	3·4	4·1	3·3	4·0	3·1	4·3	3·4	3·8	3·4	4·3	3·5	4·1	3·4	3·8	3·5	4·3	3·6	4·6	3·6	4·4	3·5	4·3	3·5
15	–	–	3·9	3·3	4·0	3·3	4·2	3·4	3·8	3·1	3·8	3·4	4·1	3·4	4·1	3·7	4·0	3·6	4·4	3·8	4·4	3·6	4·2	3·5
16	4·0	3·3	4·0	3·2	3·9	3·5	4·2	3·4	4·0	3·6	3·9	3·4	4·2	3·7	4·1	3·8	4·1	3·7	4·3	3·6	4·4	3·5	4·2	3·5
17	4·2	3·3	4·0	3·4	3·9	3·3	4·1	3·4	3·9	3·22	3·8	3·3	4·1	3·3	3·8	3·7	4·1	3·8	4·6	4·0	4·6	3·6	4·1	3·4
18	3·1	3·3	4·0	3·5	4·3	3·3	4·3	3·2	4·0	3·2	3·9	3·3	4·0	3·6	3·9	3·7	4·4	3·6	4·4	3·7	4·4	3·5	4·3	3·3
19	3·9	3·4	–	–	3·9	3·4	4·2	3·4	3·9	3·25	3·8	3·4	4·1	3·5	4·0	3·6	4·3	3·6	4·8	3·6	4·4	3·7	4·2	3·4
20	3·9	3·2	4·1	3·3	4·0	3·2	4·0	3·4	3·8	3·4	4·1	3·6	4·1	3·4	4·0	3·7	4·3	4·0	4·4	3·6	4·6	3·4	4·1	3·5
21	3·8	3·2	4·1	3·2	4·1	3·2	3·8	3·4	4·0	3·7	4·0	3·4	3·9	3·2	4·1	3·4	4·3	3·7	4·6	3·6	4·5	3·5	4·3	3·6
22	–	–	3·9	3·4	3·7	3·1	3·8	3·4	4·0	3·4	4·1	3·6	4·0	3·4	4·3	3·8	4·3	3·8	4·4	3·8	4·3	3·3	4·2	3·6
23	4·0	3·2	3·9	3·3	4·0	3·3	3·9	3·4	4·1	3·3	4·1	3·3	4·0	3·7	4·2	3·5	4·1	3·8	4·27	3·8	4·6	3·5	4·3	3·5
24	3·9	3·2	4·3	3·4	4·0	3·3	3·8	3·2	4·1	3·5	4·1	3·6	4·0	3·2	3·9	3·6	4·1	4·0	4·8	3·7	4·3	3·4	4·1	3·4
25	3·8	3·4	3·8	3·3	4·0	3·4	4·1	3·4	4·0	3·4	4·1	3·5	4·3	3·4	4·1	3·7	4·3	3·8	4·37	3·77	4·3	3·3	4·2	3·4
26	4·0	3·2	3·9	3·5	3·9	3·4	3·8	3·3	4·0	3·5	3·8	3·4	4·1	3·5	4·1	3·6	4·6	3·9	4·4	3·5	4·3	3·5	4·2	3·4
27	4·0	3·2	4·0	3·3	3·9	3·3	4·0	3·5	4·0	3·6	3·9	3·3	4·0	3·3	3·9	3·7	4·2	3·8	4·32	3·6	4·3	3·5	4·4	3·3
28	4·0	3·3	4·1	3·3	4·0	3·3	4·0	3·4	4·0	3·5	4·3	3·4	4·0	3·4	4·0	3·4	4·1	3·7	4·3	3·6	4·4	3·6	4·1	3·4
29	–	–	–	–	3·9	3·4	3·8	3·2	4·0	3·4	4·1	3·5	–	–	4·2	3·6	4·4	3·8	4·6	3·9	4·2	3·4	4·3	3·6
30	4·0	3·2	–	–	3·9	3·3	3·8	3·5	3·9	3·3	3·9	3·5	–	–	4·1	3·5	4·4	3·8	4·4	3·6	4·5	3·5	4·3	3·6
31	4·0	3·3	–	–	4·1	3·4	–	–	3·9	3·6	–	–	–	3·5	4·1	3·5	–	–	4·6	3·6	–	–	4·3	3·57
Maximum during Month	4·3	–	4·3	–	4·3	–	4·3	–	4·2	–	4·3	–	4·3	–	4·4	–	4·6	–	4·8	–	4·7	–	4·5	–
Minimum during Month	–	3·2	–	3·1	–	3·08	–	3·1	–	3·1	–	3·1	–	3·2	–	3·3	–	3·4	–	3·5	–	3·3	–	3·3

I hereby certfy that the above Table contains the daily Minimum and Maximum amount of Fat contained in the Milk sent out during 1893, as determined according to the methods of analysis given in the Appendix, and recorded in the books of the Company's Laboratory.

H. Droop Richmond, F.C.S., F.I.C., &c.

TABLE III*e*.

TABLE showing the Highest and Lowest per-centages of Fat in Milk sent out on each Day in the First Half of the Year 1894.

	January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1	4·4	3·4	4·0	3·3	4·1	3·3	4·0	3·3	4·0	3·3	4·05	3·5												
2	4·3	3·4	4·0	3·2	4·1	3·3	3·9	3·35	4·1	3·4	4·15	3·35												
3	4·1	3·4	4·0	3·3	4·1	3·3	4·1	3·35	3·85	3·15	4·15	3·6												
4	4·1	3·4	4·0	3·5	4·0	3·55	4·05	3·3	3·95	3·25	4·1	3·25												
5	4·1	3·4	4·1	3·1	4·0	3·45	4·0	3·45	3·85	3·35	4·35	3·40												
6	4·1	3·3	4·4	3·2	4·1	3·3	4·0	3·4	3·85	3·3	3·95	3·25												
7	4·3	3·57	4·1	3·2	4·0	3·3	4·2	3·4	3·9	3·25	3·95	3·35												
8	4·1	3·7	4·3	3·3	4·0	3·4	4·05	3·4	3·95	3·2	3·95	3·35												
9	4·4	3·46	4·2	3·3	3·9	3·3	3·9	3·3	4·0	3·2	3·95	3·3												
10	4·2	3·5	4·3	3·4	4·0	3·4	4·35	3·3	4·1	3·25	4·0	3·35												
11	4·2	3·5	4·0	3·6	4·1	3·4	4·1	3·35	4·05	3·2	3·85	3·2												
12	4·0	3·4	4·1	3·2	4·0	3·2	4·0	3·3	4·05	3·2	4·1	3·4												
13	4·1	3·4	4·1	3·4	4·3	3·4	4·3	3·25	4·05	3·3	3·9	3·3												
14	4·2	3·4	4·1	3·2	4·1	3·2	4·0	3·4	3·85	3·2	4·0	3·2												
15	4·2	3·4	3·9	3·4	4·3	3·3	4·2	3·5	4·2	3·3	3·9	3·25												
16	4·3	3·4	3·9	3·1	3·9	3·3	4·0	3·25	3·95	3·15	3·9	3·2												
17	4·0	3·4	3·9	3·1	4·1	3·4	4·45	3·45	4·0	3·15	3·95	3·3												
18	4·09	3·4	4·1	3·4	3·95	3·4	4·25	3·4	4·05	3·25	3·9	3·2												
19	4·1	3·4	4·1	3·3	3·9	3·2	4·15	3·35	4·0	3·25	3·9	3·4												
20	3·94	3·3	4·3	3·4	4·1	3·2	4·1	3·35	4·05	3·25	4·0	3·35												
21	4·2	3·6	4·1	3·4	3·9	3·3	4·05	3·3	3·85	3·1	4·05	3·35												
22	4·3	3·4	4·02	3·45	4·0	3·4	3·95	3·4	4·05	3·2	3·85	3·4												
23	4·1	3·4	3·9	3·2	4·0	3·4	3·9	3·25	3·95	3·1	4·1	3·35												
24	4·13	3·5	4·1	3·3	4·1	3·3	4·25	3·35	3·9	3·3	3·95	3·4												
25	4·2	3·3	4·0	3·3	4·1	3·45	4·2	3·3	3·9	3·3	3·95	3·2												
26	4·1	3·3	4·1	3·4	4·05	3·45	4·0	3·3	3·95	3·3	4·05	3·35												
27	4·1	3·4	4·3	3·4	4·1	3·2	3·95	3·2	4·0	3·2	3·85	3·35												
28	4·3	3·5	4·0	3·2	3·9	3·2	3·9	3·35	4·05	3·3	3·95	3·4												
29	4·2	3·4	–	–	4·0	3·3	3·8	3·35	4·15	3·3	3·85	3·5												
30	4·3	3·2	–	–	3·8	3·3	3·95	3·2	4·0	3·35	3·95	3·45												
31	4·1	3·4	–	–	4·1	3·4	–	–	4·0	3·45	–	–												
Maximum during Month.	4·4	–	4·4	–	4·3	–	4·45	–	4·2	–	4·35	–												
Minimum during Month.	–	3·2	–	3·1	–	3·2	–	3·2	–	3·1	–	3·2												

I hereby certify that the above Table contains the daily Minimum and Maximum amount of Fat contained in the Milk sent out during 1894 (January 1st to June 30th), as determined according to the methods of analysis given in the Appendix, and recorded in the books of the Company's Laboratory. (signed) *H. Droop Richmond*, F.C.S., F.I.C., &c.

APPENDIX.

METHODS of Analysis employed in the Laboratory of the Aylesbury Dairy Company, Limited.

Specific Gravity.—The specific gravity is estimated by means of a lactometer; the temperature of the milk is taken at the same time, and all specific gravities are corrected to 60° Fahr. by means of a table drawn up in the company's laboratory. All lactometers are tested before use in milks of known specific gravity.

Total Solids.—Five grammes of milk are measured into a weighed platinum basin, and the water is evaporated on a steam bath; the skin which forms over the milk is broken with a fine needle, and the drying on the steam bath is continued for about three and a-half hours. The basins are then removed to an air bath and dried at a temperature of about 200° Fahr. for four hours; they are then taken out, cooled in the balance case and weighed to the nearest milligramme; the weight of the basin and solids, minus the weight of the basin, multiplied by 20 gives total solids per cent.

The milk is measured by a pipette graduated to deliver 5 grammes of milk (sp. gr. 1·0325) at 60° Fahr.

The per-centage of fat is ascertained by one of the following methods:—

(1.) *Leffmann-Beam Method.*—Fifteen cubic centimetres of milk are measured into a bottle with graduated neck; 3 cubic centimetres of a mixture of equal volumes of hydrochloric acid and purified amylic alcohol are added, and the bottle well shaken; 9 cublic centimetres of strong sulphuric acid are added, and the contents of the bottle mixed. The bottle is filled to the top with diluted sulphuric acid (1 part acid and 2 parts water) and the fat separated by centrifugal force. The quantity of fat in the neck is then read off from the graduations.

All bottles before being used are tested against the Adams' method, using the same acids, &c. employed for general use, and a formula and a table constructed to connect the two.

(2.) *The Adams' Method.*—The method used is that adopted by the Society of Public Analysts. The following precautions are taken which are not laid down by the society:—(*a*) The coils are well dried; (*b*) The ether is anhydrous; (*c*) The coils are free from any matter soluble in ether; (*d*) The extraction is prolonged to five hours. An exhaustive study has shown that on the one hand all the fat is extracted and weighed as such, and on the other nothing else is weighed as fat.

(3.) *The Calculation Method.*—The fat is calculated from the total solids and specific gravity (or *vice versâ*) by the formula of Hehner and Richmond.

T (Total Solids) ·254 G (Specific Gravity)=1·164 F (Fat). This has been proved by hundreds of experiments to be correct within 0·2 per cent.

The Leffmann-Beam method has only been used wholly since 1st March 1894, and partially during 1893, and January and February 1894. The other results for fat are by the calculation method. The solids not fat are always obtained by subtracting the fat from the total solids.

The results are comparable with the methods adopted by the Society of Public Analysts.

APPENDIX, No. 6.

PAPER handed in by Mr. *H. Preston-Thomas.*

CASES decided in the High Court of Justice on the Sale of Food and Drugs Acts, 1875 and 1879; and the Margarine Act, 1887; so far as reported in the "Law Reports," "Law Journal Reports," "Law Times Reports," "Weekly Reporter," "Justice of the Peace," and "Times Law Reports," up to 7th August, 1894.

Analytical Table of Subjects.	Case.
(A) *Taking Samples:*	
(1.) At place of delivery	1—2
(2.) From a specified receptacle	3
(3.) As to Inspector showing authority	3
(4.) Offer to divide sample refused	4
(5.) Vendor seized the sample on hearing it was to be analysed. Question of Larceny	5
(B) *Notification of Mixture*	6 to 17
(C) *Notice that article is bought for Analysis*	18 to 21
(D) *Questions as to Vendor's Liability:*	
(1.) Samples procured by servant or deputy of the Inspector; selling to the prejudice of purchaser	22 to 27
(2.) No knowledge of adulteration	28 to 31
(3.) Warranty from wholesale dealer	32 to 39
E) *Standard of Strength:*	
(1.) Spirits: before Sale of Food and Drugs Act, 1879	40 to 41
(2.) Drugs: British Pharmacopœia	42
(F) *Legal Proceedings:*	
(1.) Persons who may not take proceedings	43.
(2.) Before the hearing:	
Summons issued by Justice who did not hear the complaint	44
Separate informations for separate samples	44
Particulars in summons	45 to 48
(3.) At the hearing:	
Proof of Inspector's authority	49
Variance between offence charged and offence proved	50
Sufficiency of Analyst's certificate	51 to 52
Magistrate must act on Analyst's certificate	53
(G) *Miscellaneous Cases:*	
Article sold totally different from that demanded	54
Baking powder not an article of food	55
Entire sample need not be sent to Analyst	56
Wrong label put on lard by mistake: evidence of mistake admissible	57
Margarine: exposure for sale	58—59
Skimmed milk sold as milk	60
Representation as to quality of article sold	61

LIST OF CASES.

	Number of Case.		Number of Case.
Attfield *v.* Tyler	11	Kearley *v.* Tylor (or Tonge)	57
Bakewell *v.* Davis	51	Kirk *v.* Coates	61
Barnes *v.* Chipp	18	Knight *v.* Bowers	54
Barnes *v.* Rider	47	Laidlaw *v.* Wilson	37
Betts *v.* Armstead	28	Lane *v.* Collins	60
Brown *v.* Foot	27	Liddiard *v.* Reece	15
Chappell *v.* Emson	4	Lindsay *v.* Rook	39
Crane *v.* Lawrence	58	Morris *v.* Askew	17
Dixon *v.* Wells	44	Morris *v.* Corbett	31
Dyke *v.* Gower	30	Morris *v.* Johnson	8
Elder *v.* Smithson	36	Neal *v.* Devenish	48
Farmers and Cleveland Dairies Company *v.* Stevenson.	34	Newby *v.* Sims	52
		Otter *v.* Edgley	14
Fecitt *v.* Walsh	45	Pain *v.* Boughtwood	29
Filshie *v.* Evington	2	Parsons *v.* The Birmingham Dairy Company	19
Gage *v.* Elsey	7	Pashler *v.* Stevenitt	40
Garforth *v.* Esam	26	Payne *v.* Hack	3
Hale *v.* Cole	49	Platt *v.* Tyler Wright *v.* Tyler	13
Harris *v.* May	33	Reg. *v.* Wakefield	46
Harris *v.* Williams	43	Rolfe (or Rolf) *v.* Thompson	56
Harrison *v.* Richards	53	Rook *v.* Hopley	32
Hewson *v.* Gamble	5	Rouch *v.* Hall	1
Hiett *v.* Ward	50	Sandys *v.* Markham	22
Higgins *v.* Hall	9	Sandys *v.* Small	6
Horder *v.* Meddings	16	Somerset *v.* Miller	21
Horder *v.* Scott	24	Stace *v.* Smith	25
Hotchin *v.* Hindmarsh (or Hindmarch)	35	Webb *v.* Knight	41
Hoyle *v.* Hitchman	23	Wheat *v.* Brown	59
James *v.* Jones	55	Wheeker *v.* Webb	20
Jones *v.* Bertram	38	White *v.* Bywater	42
Jones *v.* Davies	12		
Jones *v.* Jones	10		

A.

TAKING SAMPLES.

(1.)

ROUCH (*Appellant*) *v.* HALL (*Respondent*) (1880).

L.R. 6 Q.B.D. 17 ; 50 L.J.M.C. 6 ; 44 L.T. 183 ; 29 W.R. 304 ; 44 J.P. 748 ; 45 J.P. 220.

Sample taken at a Railway Station.

The Respondent supplied milk, under contract, to a London dealer. The Appellant, a food, &c., inspector, being at Euston whilst milk sent in pursuance of this contract was being unloaded from the train by a railway porter, required the porter to give him a sample of the milk. Upon this being done he told the porter that he intended to have the milk analysed, and, having divided the sample into three parts, handed one of them to the porter. The magistrate dismissed the summons on the ground that Section 14 of the Sale of Food and Drugs Act, 1875, had not been complied with,—the porter not being the agent of the seller within the meaning of the section. The inspector appealed.

Held, not necessary where a sample of milk in course of delivery is procured for analysis under Section 3 of the Sale of Food and Drugs Act Amendment Act, 1879, for the officer procuring such sample to notify to the seller, or his agent, his intention of having the sample analysed, or to deliver to the seller, or his agent, a portion of the sample in accordance with the provisions of Section 14 of the Sale of Food and Drugs Act, 1875.

(2.)

FILSHIE *v.* EVINGTON (1892).

[1892.] 2 Q.B. 200 ; 66 L.T. 199 ; 40 W.R. 380 ; 56 J.P. 312 ; 8 T.L.R. 306.

Place of delivery of Milk, carriage being paid by purchaser.

By the Sale of Food and Drugs Act Amendment Act, 1879, Section 3, certain officers therein named "may procure at the place of delivery any sample of any milk in course of delivery to the purchaser or consignee in pursuance of any contract for the sale to such purchaser or consignee of such milk"; and power is given to submit such sample for analysis, and take proceedings as provided by Section 13 of the Sale of Food and Drugs Act, 1875. The Appellant, who lived at C., contracted with a dairy company for the sale to them of the milk from his dairy, to be delivered at London, or at such other station as the purchasers should from time to time appoint ; the carriage of the milk from C. to be paid by the purchasers. The purchasers appointed H. as a station for the delivery of milk under the contract. The Appellant consigned milk from C. to the purchasers at H. ; immediately on its arrival at the latter station, and before possession was taken of it by the purchasers, a sample was taken by the Respondent, which, upon analysis, was found to be adulterated by the addition of water.

Held, that, notwithstanding the provision for payment of the carriage by the purchasers, H. was the place of delivery of the milk to the purchasers within the meaning of the section ; and the Appellant was, therefore, rightly convicted of an offence under the Acts.

(3.)

PAYNE (*Appellant*) *v.* HACK (*Respondent*) (1893).

58 J.P. 165.

Sale of Spirits out of a specified bottle. Production of Inspector's authority

P., a publican, on request, supplied H. with rum out of a bottle on a shelf in the bar. After tasting it, H. requested to have half-a-pint of rum. P., was about to supply H. out of another vessel, but H. demanded the supply out of the same bottle, saying he was an inspector, and it was for analysis. H. refused, and was summoned for such refusal under Section 17 of the Sale of Food and Drugs Act, 1875. He was convicted.

Held, (1) that as P. had not demanded to see H.'s authority, H. was not bound to produce it; (2) That P. was bound to supply the sample out of the same bottle as that from which he first supplied H.

(4.)

CHAPPELL *v.* EMSON (1884).

48 J.P. 200.

Offer to divide sample.

D. purchased from the Appellant a pint of milk, and, after the purchase was completed, told the vendor that he intended to have the milk analysed, and offered to divide it with the vendor, which offer was refused. The milk was found to be adulterated and the vendor was convicted.

Held, on appeal, that the provisions of Section 14 of the Sale of Food and Drugs Act, 1875, had been sufficiently complied with, and that it was unnecessary for the purchaser to "offer to divide the milk into three parts" in so many words.

(5.)

HEWSON (*Appellant*) *v.* GAMBLE (*Respondent*) (1892).

56 J.P. 534; 8 T.L.R. 301.

Vendor seized the Article sold on hearing it was to be Analysed: Question of Larceny.

G., an inspector, entered H's. shop, and bought a pound of coffee, which was delivered by H's. son in a tin and wrapper. G. then announced that it was for analysis and offered to divide it. H. was then called from another part of the premises, and on being told of the matter snatched the package from G., said it was not sold as pure coffee, and showed the label on the package. The appellant refused to give back the coffee, but offered to return the Respondent's money. The justices convicted H. of larceny of the package.

Held, there being no evidence of felonious intent, the justices were wrong in convicting of larceny.

B.

NOTIFICATION OF MIXTURE.

(6.)

SANDYS *v.* SMALL (1878).

L.R. 3 Q.B.D. 449; 47 L.J.M.C. 115; 39 L.T. 118; 26 W.R. 814.

Notice posted that Articles sold are Mixed.

An inspector under the Sale of Food and Drugs Act, 1875, directed his assistant to purchase from the Respondent, a publican, half a pint of whiskey. The assistant did so, at the same time informing the Respondent that it was intended to have the whiskey analysed. Upon analysis it was found to be mixed with 30 per cent. of water, and the Respondent was summoned; but the magistrate dismissed the case upon the ground that the Respondent complied with the provisions of the Act by placing in a prominent position in his bar and in several other parts of his premises a notice stating, "All spirits sold here are mixed."

Held, that the magistrates were right. Where the seller of an article brings to the purchaser's knowledge the fact that the article sold to him is not of the nature, substance, or quality of the article he demands, the sale is not "to the prejudice of the purchaser," within the meaning of Section 6 of 38 & 39 Vict. c. 63: and consequently no offence is committed under that section. The 8th section of the Act points out a mode of giving notice to the purchaser that is made by the Statute sufficient; but it is not intended by that section that whenever the mode therein specified is not adopted there shall necessarily be an offence against Section 6.

(7.)

GAGE *v.* ELSEY (1883).

10 Q.B.D. 518 ; 52 L.J.M.C. 44 ; 48 L.T. 226 ; 31 W.R. 500 ; 47 J.P. 391.

Notice posted that Articles sold are Mixed.

By Section 6 of 42 & 43 Vict., c. 30, it is provided that "in determining whether an offence has been committed under 38 & 39 Vict., c. 63, s. 6, by selling, to the prejudice of the purchaser, spirits not adulterated otherwise than by the admixture of water, it shall be a good defence to prove that such admixture has not reduced the spirits more than . . . 35 degrees under proof for gin." The Appellant sold to the Respondent gin more than 35 degrees under proof, but, at the time of sale, brought to his knowledge a printed notice hanging up in the room, to the effect that all spirits were sold as "diluted spirits, no alcoholic strength guaranteed."

Held, that although the Appellant had not a good defence under 42 & 43 Vict., c. 30, s. 6, he was not by that section deprived of any defence which he would have had under 38 & 39 Vict. c. 63, and that the sale not having been to the prejudice of the purchaser, no offence had been committed under 38 & 39 Vict., c. 63, s. 6.

(8.)

MORRIS (*Appellant*) *v.* JOHNSON (*Respondent*) (1890).

54 J.P. 612 ; 6 T.L.R. 171.

Notice that all Spirits sold are Diluted, posted in two rooms, but not in the room where the Sample was sold.

T. went into J.'s public-house and, without going into the bar or kitchen, went into a club room and asked for whiskey, and that supplied was 37 degrees under proof. A notice that "All spirits sold are diluted" was posted in the bar and kitchen, but not in the club-room, and nothing was said to T. on delivery.

Held, the justices ought to have inquired before deciding whether T. knew that the practice was at J.'s house to sell only diluted spirits, in which case no conviction was proper.

(9.)

HIGGINS *v.* HALL (1886).

51 J.P. 293.

Selling a Mixture is not an offence if a Mixture is declared.

A. went into H.'s shop and asked for half a pound of coffee. H. said she did not keep it, whereon A., pointing to certain tins labelled "coffee and chicory," H. said she sold that as a mixture, and A. asked for half a pound of it, which H. sold. The mixture contained about 30 per cent. of coffee. H. was charged under Section 6 of the Sale of Food and Drugs Act, 1875, with selling coffee not of the nature, &c., of coffee.

Held, the justices were wrong in convicting H. of selling coffee, for that she sold only a mixture, as she was entitled to do, and in doing which she committed no offence within the above section.

(10.)

JONES (*Appellant*) *v.* JONES (*Respondent*) (1894).

58 J.P. 132 (note only).

Selling a Mixture : Sufficiency of Label on Packet of Cocoa.

J. was summoned for selling cocoa which was not cocoa as demanded, but a mixture of starch, sugar, and cocoa The justices convicted J., who appealed, and at quarter sessions the justices were equally divided, but stated a case. The cocoa sold was in a packet on which was a label which stated that the cocoa was mixed ; but no attention was called to this by the seller, and the packet was wrapped in opaque paper and delivered to the purchaser. On analysis, the contents were found to be 30 per cent. cocoa, and 70 per cent. starch and sugar. J. contended that there was a sufficient notice that the article was mixed, and there was no evidence of fraud.

Held, that the notice of a mixture was sufficient, and, there being no evidence of fraud, the conviction was wrong.

(11.)

ATTFIELD (*Appellant*) *v.* TYLER (*Respondent*) (1893).

57 J.P. 357.

Selling a Mixture : Notice of Mixture given in very small Type.

A. was charged with selling cocoa not of the nature, substance, and quality demanded. A. asked for a quarter of a pound of cocoa, when various cocoas were submitted, and A. said he would have Epps's cocoa, for which he paid 3½*d.* When sold, A. said : "I sell this cocoa as I receive it from Epps." The analyst found it adulterated with 40 per cent. of starch and sugar. There was a wrapper round the tin stating that the cocoa was mixed. The

 evidence

evidence was that West India arrowroot and sugar were mixed to modify the effect of the cocoa butter, and prevent the heavier particles settling, the cocoa not being fit for consumption without the arrowroot. A. contended that he was within the 8th section, as the ingredients mixed were not injurious or used fraudulently.

The justices held that the label did not distinctly or legibly state the cocoa was mixed, the type being so small that it required a magnifying glass, and convicted A.

Held, the justices were wrong.

(12.)

JONES (*Appellant*) *v.* DAVIES (*Respondent*) (1893).

57 J.P. 808 ; 9 T.L.R., 492.

Selling a Mixture : Sufficiency of label on tin of Condensed Milk.

The Appellant purchased at the Respondent's shop a tin of condensed milk for 4½*d.* At the time of purchase the attention of the Appellant was not called to any label on the tin, but he saw on it a label with "Condensed Milk, Swiss Dairy Brand" in large letters, and in smaller type on the back of the tin, "Swiss Dairy Brand. This tin contains skimmed milk prepared with the finest sugar. It will be found cheaper than ordinary fresh milk and useful for all household purposes. The Condensed Milk Company of Ireland (Limited) Limerick."

It was proved that 93 per cent. of the butter fat had been abstracted from the milk and that the material was injuriously affected thereby.

The questions for the Court were :—

(1.) Whether disclosure and label, such as were proved, would, without specially calling the purchaser's attention thereto, be a sufficient disclosure under Section 9 of the Sale of Food and Drugs Act, 1875.

(2.) Whether, under the circumstances, the label contained a sufficient disclosure of the alterations proved.

Held, there was a sufficient disclosure under Section 9 of the Act, that the milk had been skimmed before condensation.

(13.)

PLATT (*Appellant*) *v.* TYLER (*Respondent*); WRIGHT (*Appellant*) *v.* TYLER (*Respondent*) (1894).

58 J.P. 71.

Selling a Mixture : Sufficiency of label on tin of Condensed Milk.

These cases were similar. In the first case P. was charged under Sections 8 and 9 of the Sale of Food and Drugs Act, 1875, with selling condensed milk from which 80 per cent. of fat had been abstracted without making disclosure of the alteration.

The purchaser went into the shop and asked for a tin of condensed milk. He was told that there were several sorts of condensed milk at different prices, and that some of them were skimmed milk. He decided to have a tin at 3½*d.* The tin was handed to him and he duly declared that he had bought it for analysis, and divided it into parts. The owner of the shop then came forward and told him the article supplied was condensed skimmed milk, and drew his attention to the label on the back of the tin which contained (among others) the following words : "Calf brand. This tin contains skimmed milk with nothing added but the finest sugar."

The label on the front of the tin described the article as "Condensed Milk (calf brand.)" The justices found as a fact that the label was not, either by its position or conspicuousness, and especially having regard to the fact that the article was described in the main part of the label as "condensed milk," and not as "condensed skimmed milk," a label distinctly printed delivered with the article.

The justices convicted.

Held, that the cases were concluded by the authority of Jones *v.* Davies, and that the justices were wrong in holding that there was not a sufficient compliance with the Act.

(14.)

OTTER (*Appellant*), *v.* EDGLEY (*Respondent*) (1893).

57 J.P. 457.

Selling a Mixture : Quantity of Coffee in Mixture immaterial when a Mixture is notified.

O. sold French coffee, the label stating that it was mixed with chicory, and the purchaser was also told the same. The analysis showed there was 60 per cent. of chicory, and 40 per cent. of coffee. The justices convicted O., holding that, as the proportion of chicory was not stated, it must have been added fraudulently to increase the bulk.

Held, the justices were wrong, and that there was no evidence to support a conviction.

(15.)

LIDDIARD *v.* REECE (1879).

44 J.P. 233.

Selling a Mixture: Notice that the Article sold is a Mixture does not protect Seller when the Mixture is fraudulently made.

After supplying a purchaser who had asked for half-a-pound of "coffee" and before the purchase was removed from the counter, the vendor called his attention to a printed label on the package, stating "This is sold as a mixture of chicory and coffee." The purchaser thereupon proceeded to act in pursuance of Section 14 of the 38 & 39 Vict. c. 63, and, proceedings being instituted, the magistrates convicted the vendor of an offence under Section 6 of the Act: 1st, because the purchaser having asked for "coffee" was supplied with something not of the nature, quality, or substance of the article demanded; 2nd, because the mixture of chicory appeared to be intended fraudulently to increase the bulk, weight or measure of the article, the price charged being that usually charged for pure coffee; 3rd, because the purchaser's attention had not been called to the label until after the purchase was completed. From this decision the vendor appealed upon the ground that he was protected by Section 8 of the Act, and cited Sandys *v.* Small.

The conviction was affirmed upon the ground that, the magistrates having found that the coffee was fraudulently mixed with intent to increase the bulk, the mere fact of the notification on the label did not protect the seller.

(16.)

HORDER (*Appellant*) *v.* MEDDINGS (*Respondent*) (1880).

44 J.P. 234.

Selling a Mixture: Large proportion of Chicory: Question of Fraud.

An inspector under the Sale of Food and Drugs Act, 1875, sent to the Respondent's shop for a quarter-of-a-pound of coffee. The Respondent's servant, who was in charge of the shop, placed a paper on the scale and weighed out the quantity required from a canister labelled "Symington's Coffee." Whilst the article was being weighed the girl stated the price to be 1*s.* 4*d.* a pound, and the purchaser then stated that he bought the article for analysis. The coffee was thereupon wrapped up in the paper, which had stamped upon it "This is sold as a mixture of chicory and coffee." The purchaser was told that he could have coffee-berries ground for him but at a higher price. He declined. He saw the label before paying for the article, and knew before the sale was complete that it was a mixture of chicory and coffee. On analysis the article was found to contain 85 per cent. of chicory and 15 per cent. of coffee.

The magistrate dismissed the case.

Held, that the magistrate was bound, notwithstanding the label, to find whether the chicory was used fraudulently to increase the bulk, and that, if so, he ought to convict.

Case remitted to the magistrate.

(17.)

MORRIS (*Appellant*) *v.* ASKEW (*Respondent*) (1893).

57 J.P. 724

Selling a Mixture: Notice posted that Articles sold are mixed: Sufficiency of Notice.

A., a publican, was charged under 38 & 39 Vict. c. 63, s. 6, with selling rum, which was not of the nature, &c. of the article, being adulterated with 19 per cent. of added water. On the purchaser asking for rum A. said he had two qualities, one at 1*s.*, another at 1*s.* 2*d.* per half-pint, and the quality at 1*s.* was supplied. The analysis showed that the rum was 38 degrees under proof, and contained 19 per cent. of water beyond the limit specified in 42 & 43 Vict. c. 30, s. 6. There was this notice stuck up in the house, "All spirits sold here are diluted in accordance with the new excise regulations."

The justices held the notice was sufficient, and dismissed the summons.

Held, the justices were wrong, as the mere notice itself was not a protection, and that the justices should have determined whether the purchaser was prejudiced.

C.

NOTICE THAT ARTICLE IS BOUGHT FOR ANALYSIS.

(18.)

BARNES *v.* CHIPP (1878).

L.R., 3 EX. D. 176; 47 L.J.M.C. 85; 38 L.T. 570; 26 W.R. 635.

Purchasing Samples: Notification by Purchaser to Seller that Article is bought for Analysis.

Acting under the direction of the inspector of weights and measures, a police constable bought gin from the barmaid of an inn with the intention of submitting it to analysis. He then told her that he was a police constable, and that he had bought the gin for the purpose of analysis, but did not add "by the public analyst." The inspector afterwards had the gin analysed by the public analyst, and obtained his certificate that it was diluted. Thereupon the innkeeper was prosecuted under Sections 20 and 21 of the Sale of Food and Drugs Act, 1875, and was summarily convicted of an offence against Section 6.

 Held,

Held, that the notification required by Section 14, that the article is to be "analysed by the public analyst," was a condition precedent to a prosecution under the Act, and that the conviction must be quashed.

[*See* Wheeker *v.* Webb].

(19.)

PARSONS (*Appellant*) *v.* THE BIRMINGHAM DAIRY COMPANY (*Respondents*) 1882).

L.R. 9, Q.B.D. 172; 51 L.J.M.C. 111; 30 W.R. 748; 46 J.P. 727.

Purchasing Samples: Notification by Purchaser to Seller that Article is bought for Analysis.

The Respondents had a contract with the Appellant for the supply of milk, and they caused some of the milk supplied to them by him to be analysed, but did not give him notice of their intention to do so, and did not otherwise comply with the provisions of Section 14 of the Act of 1875.

Held, that the provisions of Section 14 of Sale of Food and Drugs Act, 1875, apply to the case of a private purchaser under Section 12 as well as to that of a public officer under Section 13; and, therefore, where a private purchaser does not duly notify to the seller of an adulterated article his intention to have the article analysed by a public analyst, he is debarred from proceeding against the seller under the Act.

(20.)

WHEEKER (*Appellant*) *v.* WEBB (*Resp ondent*) (1887).

51 J.P. 661.

Purchasing Samples: Notification by Purchaser to Seller that Article is bought for Analysis.

W., the seller of spirits, was informed after the purchase that the article was to be examined by the "county analyst," and W. knew that the county analyst was the public analyst of the place.

Held, the notice to W., was sufficient, though the words "public analyst" were not expressly used by the purchaser.

(21.)

SOMERSET *v.* MILLER (1890).

54 J.P. 614.

Purchasing Samples: Notice from Purchaser to Seller that Article was bought for Analysis.

S., the inspector, standing outside, sent B., a constable, into M.'s inn to buy gin, and after B. came out both went two minutes later inside and told M., that the gin was bought for analysis and divided it. The gin was found 37 degrees under proof.

Held, that the justices were wrong in holding that the object of the purchase was not notified "forthwith," pursuant to Section 14 of the Sale of Food and Drugs Act, 1875.

D.

QUESTIONS AS TO VENDOR'S LIABILITY.

(1.) Samples procured by servant or deputy of the inspector: selling to the prejudice of the purchaser.

(22.)

SANDYS *v.* MARKHAM (1877).

41 J.P. 52.

Vendor's Liability: Is the Sale to the Prejudice of the Purchaser?

Where adulterated mustard had been purchased by an inspector for the purpose of being analysed, and the point was raised that the inspector was not prejudiced as a purchaser under Section 6 of the Food and Drugs Act, 1875, Lush. J., said, *obiter*: "Surely if the purchaser did not get pure mustard, as he was entitled to, prejudice must be presumed."

[*The case was remitted to the Justices for further information, but whether it came again before the Court the reports do not show.*

The point as to prejudice, referred to in the above dictum of Lush. J., was settled by the Sale of Food and Drugs Act Amendment Act, 1879, *Section* 2.]

(23.)

HOYLE *v.* HITCHMAN (1879).

L.R. 4 Q.B.D. 233 ; 48 L.J.M.C. 97 ; 40 L.T. 252 ; 27 W.R. 487.

Vendor's Liability: Is the Order to the Prejudice of the Purchaser?

An inspector who purchases a sample of food or drugs under Section 13 of the Sale of Food and Drugs Act, 1875, for the purpose of having it analysed by a public analyst, is to be regarded as a purchaser who has suffered "prejudice" under Section 6 of the same Act, if the sample should prove not to be of the nature or quality of the article which he asked for.

The word "purchaser" in Section 6 includes a person authorised to purchase for the purpose of testing the article.

The "offence" contemplated by the Act consists in fraudulently selling an inferior article to that demanded and paid for.

If a purchaser asks for a certain article, and gets an article which by reason of some admixture of a foreign article is not of the nature or quality of the article he asks for, he is necessarily prejudiced.

[See *Sale of Food and Drugs Act Amendment Act*, 1879, *Section* 2.]

(24.)

HORDER *v.* SCOTT (1880.)

L.R. 5 Q.B.D. 552 ; 49 L.J.M.C. 78 ; 42 L.T. 660 ; 28 W.R. 918 ; 44 J.P. 520.

Purchase of Samples by Deputy.

The Appellant's assistant bought "best coffee" at the Respondent's shop. On analysis it was found to contain a large proportion of chicory. The Respondent was summoned, but the justices dismissed the case on the ground (amongst others) that the proceeding having been instituted by the Appellant in his official capacity, he, and not his assistant, should have purchased the article and dealt with it.

Held, the decision was wrong.

An inspector appointed under the Sale of Food and Drugs Act, 1875, may employ a deputy to purchase articles for the purpose of analysis, and may properly institute proceedings against the seller of such articles if the result of the analysis discloses an offence against the Act.

It is not necessary that the officer taking such proceedings should have acted personally in the purchase of the sample, and the person purchasing the sample on his behalf need not himself deliver the sample to the analyst, but may hand it to another for the purpose of such delivery.

(25.)

STACE (*Appellant*) *v.* SMITH (*Respondent*) (1880).

45 J.P. 141.

Purchase of Sample by Deputy: Information laid by Principal.

S., the sanitary inspector, went with D. to a shop where butter was sold, and sent into the shop D., who bought a pound of butter for a shilling. D. came out and gave it to S., who within two minutes went inside and gave notice to the shopkeeper that he had bought it for analysis, and he then and there divided it into parts, &c. S. laid the information for selling butter not of the nature, &c. of butter.

Held, the purchaser of the article was S. and not D., and that S. properly gave the notice and laid the information.

(26.)

GARFORTH *v.* ESAM (1892.)

56 J.P. 521 ; 8 T.L.R. 243.

Purchase of Sample by Deputy: Question of Prejudice to Purchaser.

A food inspector sent his servant into a public-house to purchase a bottle of gin. When the servant had been in the house a minute, and had paid for the gin, the inspector entered. He had given the servant the money to buy the gin.

Held the inspector was the purchaser, and the justices were wrong in dismissing the information on the ground that he was not the purchaser, and was not prejudiced.

(27.)

BROWN *v.* FOOT (1892).

61 L.J.M.C. 110; 66 L.T. 649; 56 J.P. 581; 8 T.L.R. 268.

Vendor's liability: Article sold by servant.

The servant of a milk salesman, employed by his master to sell milk, adulterated it with water. The master was convicted as the seller of the adulterated milk under Section 6 of the Sale of Food and Drugs Act, 1875, and fined the full penalty of 20*l.*

Held, that the conviction was right, whether the master did or did not, connive at the offence.

[The case was remitted to the magistrate with an expression of the Court's opinion that evidence of connivance was not necessary to prove the offence, but that it was admissible if he thought it desirable with a view to mitigating the penalty.]

D.

QUESTIONS AS TO VENDOR'S LIABILITY.

(2.) No knowledge of adulteration.

(28.)

BETTS (*Appellant*) *v.* ARMSTEAD (*Respondent*) (1888).

L.R. 20 Q.B.D. 771; 57 L.J.M.C. 100; 58 L.T. 811; 36 W.R. 720; 52 J.P. 471.

Knowledge of Adulteration not necessary to sustain Conviction under Section 6.

The Respondent sold, to the prejudice of the purchaser, a loaf containing a quantity of alum, and he was prosecuted therefor under Section 6 of the Sale of Food and Drugs Act, 1875. He stated in defence that he did not know the bread contained alum, and that it must have been in the flour which he had bought.

Held, that an offence within that section was committed, although the seller did not know that the article sold was not of the nature, substance, and quality demanded.

(29.)

PAIN (*Appellant*) *v.* BOUGHTWOOD (*Respondent*) (1890).

L.R. 24 Q.B.D. 353; 59 L.J.M.C. 45; 62 L.T. 284; 38 W.R. 428; 54 J.P. 469; 16 Cox, C.C. 747; 6 T.L.R. 167.

Knowledge of Adulteration not necessary to sustain Conviction under Section 9.

By Section 9 of the Sale of Food and Drugs Act, 1875, "no person shall, with the intent that the same may be sold in its altered state without notice, abstract from an article of food any part of it so as to affect injuriously its quality, substance, or nature, and no person shall sell any article so altered without making disclosure of the alteration under a penalty in each case not exceeding 20*l.*"

The Appellant purchased a pint of milk at the Respondent's shop. It was found that of the sample sent to the analyst, 28 per cent. of the original fat had been abstracted. No evidence was given that the person selling the milk knew of the alteration, and the Respondent and his shop manager denied knowledge of it.

Held, that a person selling the altered article could be convicted under Section 9, although at the time he sold it he did not know of the alteration.

(30.)

DYKE *v.* GOWER (1891).

(1892.) 1 Q.B. 220; 61 L.J.M.C. 70; 65 L.T. 760; 56 J.P. 168; 17 Cox, C.C. 421; 8 T.L.R. 117.

Selling an article "in its altered state:" Ignorance of alteration no defence.

By Section 9 of the Sale of Food and Drugs Act, 1875, "no person shall, with the intent that the same may be sold in its altered state without notice, abstract from an article of food any part of it, so as to affect injuriously its quality, substance, or nature, and no person shall sell any article so altered without making disclosure of the alteration, under a penalty in each case not exceeding 20*l.*"

Held, that the words "so altered" refer to a physical alteration of the article, irrespective of the intent with which the alteration is made. [The Respondent, a retail milk seller, poured into a pail eight barn gallons of unskimmed milk, which she sold therefrom in small quantities to her customers, dipping it out of the pail from time to time with a measure. The sale of the contents of the pail extended over a space of between four and five hours, during the whole of which time, owing to the neglect of the Respondent to keep the milk stirred, the cream was continually rising to the surface. When not more than two quarts of milk remained in the pail, the Appellant purchased of the Respondent a pint

of

of milk, which was served to him from the pail, and which, upon analysis, showed a deficiency of 33 per cent. of fatty matter. The Respondent did not disclose the deficiency to the Appellant. The deficiency was entirely due to the manner in which the earlier customers had been served.

Held, that the Respondent, in so selling the milk to the Appellant without disclosing its condition, was guilty of an offence against the above section.

(31.)

MORRIS (*Appellant*) *v.* CORBETT (*Respondent*) (1892).

56 J.P. 649.

Knowledge of Adulteration not necessary to sustain Conviction under Section 9.

The servant of C., a dairyman, being short in his supply of milk, bought two gallons from another dairyman and mixed it with his own, and sold the same to customers. C., being summoned under Section 9 of the Sale of Food and Drugs Act, 1875, it was held, that though neither C. nor C.'s servant knew or had reason to suspect the milk was adulterated, this was no defence.

D.

VENDOR'S LIABILITY.

(3.) Warranty from wholesale dealer.

(32.)

ROOK *v.* HOPLEY (1878).

L.R. 3 Exch. D. 209 ; 47 L.J.M.C. 118 ; 38 L.T. 649 ; 26 W.R. 663.

Warranty.

An information laid against the Respondent for having sold adulterated lard had been dismissed. The analyst had certified that the lard in question contained 15 per cent. of water, but the Respondent rested his defence upon Section 25 of the Sale of Food and Drugs Act, 1875, inasmuch as he had bought the lard from a person who, it was stated, had given therewith "a written warranty," as required by that section. The Appellant, however, contended that this was not the warranty contemplated by the section but mere description, being in the following terms: "Bought by Mr. Hopley, &c., four tins of lard, No. 1, 28 lbs. each, at—." On the other hand, it was argued that the Respondent came within the exception in Section 6 of the Act, as the water to which the analyst referred was not injurious to health, but simply necessary to the manufacture of the article.

Held, that the invoice did not constitute a warranty within Section 25 so as to discharge the Defendant.

(33.)

HARRIS *v.* MAY (1883).

L.R. 12 Q.B.D. 97 ; 53 L.J.M.C. 39 ; 32 W.R. 595 ; 48 J.P. 261.

Warranty.

By Section 25 of the Sale of Food and Drugs Act, 1875, "if the Defendant, in any prosecution under this Act, prove to the satisfaction of the justices that he had purchased the article in question as the same in nature, substance, and quality as that demanded of him by the prosecutor, and with a written warranty to that effect," he shall, under certain other specified conditions be entitled to be discharged from the prosecution.

Upon the hearing of an information against the Appellant for having, contrary to the provisions of the Act, sold on the 12th of April, 1883, certain milk to the Respondent, which was not of the nature, substance, and quality demanded by him, as it contained a percentage of water, the Appellant proved that he had purchased the article in question under a written contract made with F. on the 24th of March, 1883, whereby F. agreed to sell to the Appellant 86 gallons of good and pure milk (each and every day) for six months, "the said milk to be delivered twice daily."

Held, that this contract did not constitute a written warranty within the meaning of Section 25 in respect of the specific article sold by the Appellant to the Respondent on the 12th of April ; and, therefore, that the Appellant was not entitled to be discharged from the prosecution.

See *Laidlaw* v. *Wilson.*

(34.)

FARMERS AND CLEVELAND DAIRIES COMPANY *v.* STEVENSON (1890).

60 L.J.M.C. 70 ; 63 L.T. 776 ; 55 J.P. 407 ; 17 Cox, C.C. 201.

Warranty.

Upon the hearing of an information against the Appellants for having sold certain milk to the Respondent, which was not of the nature, substance, and quality demanded by him, viz., 20 per cent. of its original fat having been abstracted, the Appellants proved that they purchased the milk under a contract by which the Higham Company agreed to supply them daily with a certain quantity of "genuine good new milk of the best quality with all its cream on," and by which the vendor warranted each supply of milk to be pure, genuine and unadulterated, and that attached to the churn which contained the milk of which the milk in question was part, was a label bearing the words "warranted genuine new milk with all its cream on."

Held, that the contract and the label together constituted a written warranty within the meaning of Section 25 of the Sale of Food and Drugs Act, 1875.

(35.)

HOTCHIN *v.* HINDMARSH (or HINDMARCH) (1891).

[1891.] 2 Q.B. 181 ; 60 L.J.M.C. 146 ; 65 L.T. 148 ; 39 W.R. 607 ; 55 J.P. 775 ; 7 T.L.R. 513.

Warranty.

H., who was a servant of the F. Dairies Company, and acting as such, sold to the Respondent milk which contained 12 per cent. of added water.

Held, that H. was properly convicted as a seller of the milk under Section 6 of the Sale of Food and Drugs Act, 1875 (38 and 39 Vict., cap. 63).

The milk in question was consigned to the F. Dairies Company by railway in cans bearing labels which stated that the contents were " warranted genuine new milk with all its cream on. From R. T."; and there was a written agreement between the F. Dairies Company and R.T., whereby he contracted to supply them for six months with milk warranted pure and with all its cream on. H. did not test the milk on receiving it, although he had an instrument for the purpose, and frequently tested milk when so received by him.

Held, that Section 25 of the Sale of Food and Drugs Act, 1875, was not applicable, and that even if it would have entitled H. to be discharged from the proceedings, he had not established that at the time when he sold the milk he had no reason to believe that its quality was otherwise than as demanded of him by the Respondent.

(36.)

ELDER (*Appellant*) *v.* SMITHSON (*Respondent*) (1893).

57 J.P. 809.

Warranty.

S. sold lard to E. which was adulterated with 8 per cent. of beef fat, and was charged under 38 and 39 Vict. c. 63, sec. 6. The defence was that it was bought from the manufacturer in skins, which were stamped with the words " warranted pure."

Held, no sufficient warranty to satisfy Section 25 of the statute, and no defence.

(37.)

LAIDLAW *v.* WILSON (1894).

[1894.] 1 Q.B. 74 ; 63 L.J.M.C. 35 ; 42 W.R. 78.

Warranty.

A firm of lard manufacturers on December 17th, 1892, entered into a written contract for the sale of lard to the Respondent in the following terms: " We have this day sold to you three tons Kilvert's Pure Lard for delivery to end of January, 1893." On December 23rd a parcel of lard was consigned to the Respondent by the said manufacturers and delivered to him under the said contract. The Respondent subsequently sold a portion of such parcel to the Appellant as and for lard. Upon analysis it turned out to be adulterated. The Respondent had sold it *bonâ fide* and in the same state as it was in when he bought it. On an information against the Respondent for having, contrary to the provisions of the Sale of Food and Drugs Act, 1875, sold the lard not being of the nature, substance, and quality, demanded by the Appellant.

Held, that the contract of December 17th contained a sufficient written warranty of purity in respect of the specific parcel consigned on December 23rd to satisfy Section 25 of the Act, and that the Respondent was entitled to be discharged from the prosecution.

(38.)

JONES (*Appellant*) *v.* BERTRAM (*Respondent*) (1894).

58 J.P. 116 : 478.

Warranty.

B., a refreshment contractor, obtained a warranty from a milk contractor to supply milk from which the cream was not extracted, and without water or other substance added when delivered. C. purchased, at 7·30 p.m., some milk which had been so delivered at 10.30 a.m., and, on analysis, it was found to contain 36 per cent. of added water. B. was summoned under 38 and 39 Vict. c. 63, s. 6, and contended that he was protected by Section 25, for he sold the milk under a warranty, and in the same state, &c., as he received it. The magistrate found that B. had sold the milk under a warranty, and had no reason to believe that it was not pure, and dismissed the summons.

Held, that B. was not protected by the 25th section, because the magistrate had not found that the milk was in the same state as when B. received it, and the case was remitted to him to find on that point.

(39.)

LINDSAY (*Appellant*) *v.* ROOK (*Respondent*) (1894).

10 T.L.R. 643.

Warranty.

H. purchased from the Appellant a pint of malt vinegar which was supplied from a cask in Appellant's shop, having on it a red label, bearing, in print, the words "Vinegar, warranted unadulterated—Grimble & Co. (Limited), Cumberland Market, London." It was proved that the vinegar so sold by the Appellant was invoiced to her as "Grimble's Vinegar," and that the cask supplied contained on its end the red-printed label referred to ; that the vinegar was pure malt vinegar, but that it contained 30 per cent. of added water, such addition not being injurious to health, but being made for the production and preparation of the said vinegar as an article of commerce in order that the same might be sold at a low price ; and that it was sold as she had purchased it. It was contended for the Appellant on the above facts that she was protected by Section 25 of the Sale of Foods and Drugs Act, 1875, the label and invoice amounting to a written warranty within the meaning of the Act. The magistrates convicted the Appellant.

Held, that there was a warranty within the meaning of the section. Conviction quashed.

E.

STANDARD OF STRENGTH.

(*a.*) Spirits : before 1879. (*b.*) Drugs : British Pharmacopœia.

(40.)

PASHLER *v.* STEVENITT (1876).

35 L.T. (N.S.) 862.

Strength of Spirits.

The Appellant had sold as "gin" a liquid which, according to the certificate of the public analyst, was composed of 26 per cent. of alcohol, 70 per cent. of water, and 4 per cent. of sugar. The analyst at the hearing stated that it was 44 per cent. under proof, and that he should describe it as "gin whose alcoholic strength is exceedingly low." Evidence was adduced to show that gin was sold by retailers at strength varying from proof to 20 per cent. under proof.

Held, upon a case stated, that the facts justified the justices' finding that this liquid was not of the quality of gin, but that the excess of water was a fraudulent increase of the measure of the article within the enacting part of Section 6 of the Sale of Food and Drugs Act, 1875.

[*See now the Sale of Food and Drugs Act Amendment Act*, 1879.]

(41.)

WEBB *v.* KNIGHT (1877).

L.R. 2 Q.B.D. 530 ; 46 L.J.M.C. 264 ; 36 L.T. 791 ; 26 W.R. 14.

Strength of Spirits.

The Appellant had been convicted before a magistrate of selling gin which was not of the nature, substance, or quality of the article demanded by the purchaser. It appeared that the Respondent, who was an inspector under the Sale of Food and Drugs Act, 1875, had gone to the hotel kept by the Appellant, and there asked for a pint of gin. He was told that he could have it either at 2*s.* or 1*s.* 4*d.* the pint, and he took that at 1*s.* 4*d.* The analyst found that the gin thus purchased was 43 per cent. under proof, but that it was not so adulterated as to be injurious to health.

Held, that whether the mixture in question was what a purchaser buying gin, without any further description, would reasonably expect to receive, was a question of fact for the magistrate ; and that there was sufficient evidence to justify the conviction.

[*See now the Sale of Food and Drugs Act Amendment Act*, 1879.]

(42.)

WHITE *v.* BYWATER (1887).

19 Q.B.D. 582 ; 36 W.R. 280 ; 51 J.P. 821.

Standard of quality of Drugs—British Pharmacopœia.

Upon a complaint under Section 6 of the Food and Drugs Act, 1875, for selling tincture of opium which was not "of the nature, substance, or quality" of the article demanded by the purchaser, it appeared that the drug which was sold as "tincture of opium" by the Defendant was deficient in opium to the extent of one-third and in alcohol to the extent of nearly one-half as compared with the standard prescribed by the British Pharmacopœia.

Held, that the Defendant was liable to be convicted, although the purchaser had not specifically asked for tincture of opium "prepared according to the recipe in the British Pharmacopœia."

F.

LEGAL PROCEEDINGS.

(1.) Persons who may not take proceedings.

(43.)

HARRIS *v.* WILLIAMS (1889).

6 T.L.R. 47.

Proceedings by Consignees or Purchasers.

H., a milk contractor, agreed to supply W. with from 25 to 30 gallons of milk daily, at a price varying with the time of the year. One morning P. attended at W.'s premises, at W.'s request, and took a sample from milk which H.'s servant was in course of delivering. Th esample was divided by P. into three parts, and one was handed to H.'s servant, who was told that the sample was taken for analysis by the public analyst. The sample was sent to the analyst through the Vestry Clerk, who also transmitted the analyst's certificate to W. The Vestry had no cognizance of the proceeding, nor was the Vestry Clerk acting in his official capacity in sending the sample to the analyst, nor did he send it with any view to a prosecution. P. was not an officer of the Vestry. A complaint was laid by W. against H. under Section 6 of the Sale of Food and Drugs Act, 1875, and H. was convicted.

Held, the conviction was wrong.

Where milk is delivered wholesale under a contract, the purchaser or consignee cannot institute proceedings under the Sale of Food and Drugs Act, 1875. Proceedings in such cases can only be taken according to Section 3 of the Sale of Food and Drugs Act, 1879, by the officers mentioned in the section under the direction and at the cost of the local authority.

F.

LEGAL PROCEEDINGS.

(2.) Before the hearing.

(44.)

DIXON *v.* WELLS (1890).

L.R. 25 Q.B.D. 249 ; 59 L.J.M.C. 116 ; 62 L.T. 812 ; 38 W.R. 606 ; 54 J.P. 725 ; 6 T.L.R. 322.

Summons issued by a Justice who did not hear the Complaint.

A complaint having been made to two justices of a borough against the Appellant for an offence under the Sale of Food and Drugs Acts, a summons was signed and issued by another justice, who had not heard the complaint, and was served on the Appellant. The Appellant thereupon appeared before the stipendiary magistrate of the borough, but objected that the summons was invalid, and the magistrate had no jurisdiction to hear the case. The magistrate being of opinion that the defect, if any, in the summons, was cured by the appearance of the Appellant, heard the case and convicted him.

Held, that the summons, having been signed and issued by a justice who had not heard the complaint, was invalid ; that the defect was not cured by the appearance of the Appellant, as he appeared under protest ; that the provisions of Section 10 of the Sale of Food and Drugs Act Amendment Act, 1879, were imperative, and not merely directory, and that as no summons had been duly served in accordance with them the magistrate had no jurisdiction, and the conviction was wrong.

(45.)

FECITT *v.* WALSH (1891.)

[1891.] 2 Q.B. 304 ; 60 L.J.M.C. 143 ; 65 L.T. 82 ; 39 W.R. 525 ; 55 J.P. 726 ; 17 COX, C.C. 322.

Separate Informations for separate Samples.—Provisions in Contract as to Deficiency of Cream supplied in Milk.

The Appellant contracted to supply milk to a workhouse at a certain price ; by the contract the milk was to contain a certain percentage of cream ; it was to be tested on each delivery, and a reduction was to be made in the price in respect of any deficiency in cream. While the daily supply, contained in five cans, was being delivered at the Workhouse, the Respondent, acting under Section 3 of the Sale of Food and Drugs Act Amendment Act, 1879, procured a sample from each of the five cans ; there being a large deficiency of cream in two of the samples, the Respondent subsequently laid two separate informations against the Appellant in respect of those two samples under Section 9 of the Sale of Food and Drugs Act, 1875. The justices convicted the Appellant in a separate penalty upon each information.

Held, that the procuring of each sample was a separate transaction ; that the Appellent had committed a separate offence as to each can in respect of which an information was laid ; that the separate informations were, therefore, properly laid, and the convictions were right.

Held, further, that the provisions in the contract as to deficiency of cream were immaterial in the determination of the question whether the Appellant had committed an offence under the Act.

(46.)

REG. *v.* WAKEFIELD (1890).

54 J.P. 148 (note only).

Particulars in Summons.

This was a rule calling on justices to state a case. They had convicted a person of selling milk not of the nature, substance, and quality demanded. The milk had been analysed and water found to be mixed, but the summons did not give any particulars as to how the milk was adulterated, but merely stated that the thing demanded was new milk. The Defendant did not ask for an adjournment, but contended that the statement of particulars of adulteration was a condition precedent, and that the justices acted without jurisdiction.

Held, that it was for the justices to decide if there were sufficient particulars. Rule discharged.

(47.)

BARNES (*Appellant*) *v.* RIDER (*Respondent*) (1892).

62 L.J.M.C. 25 ; 56 J.P. 709 ; 57 J.P. 473.

Particulars in Summons.

B. was summoned for selling on the 30th of June a pint of milk not of the nature, substance, and quality demanded by the purchaser. No particulars of the offence were stated in the summons in pursuance of 42 & 43 Vict. cap. 30, Section 10, nor was it stated in what manner the milk had been adulterated. This objection was taken by B. It appeared, however, that before the summons was issued, the Appellant was informed that the milk was said to have been adulterated with water. The magistrate convicted B.

Held, the magistrate was wrong.

[*The decision in Barnes* v. *Rider was disapproved in Neal* v. *Devenish.*]

(48.)

NEAL *v.* DEVENISH (1894).

[1894.] 1 Q.B. 544 ; 63 L.J.M.C. 78 ; 70 L.T. 628 ; 58 J.P. 246.

Particulars in Summons.

The Appellant was charged under Section 6 of the Sale of Food and Drugs Act, 1875, with unlawfully selling to the prejudice of the purchaser milk "which was adulterated, and was not of the nature, substance, and quality demanded by the purchaser." The Appellant appeared, but objected that particulars of the offence were not stated in the summons in compliance with Section 10 of the Act of 1879. The justices held that the Appellant was not misled by the form of summons, and that the statement therein was sufficient, and they convicted the Appellant.

Held, that the conviction was right.

Although Section 10 of the Sale of Food and Drugs Act Amendment Act, 1879, provides that in all prosecutions under the principal Act particulars of the offence of which the seller is accused shall be stated on the summons, the omission of such particulars from the summons does not deprive the justices of jurisdiction, but merely entitles the Defendant to an adjournment of the hearing in the event of the justices being satisfied that he is prejudiced by such omission.

F.

LEGAL PROCEEDINGS.

(3.) At the hearing.

(49.)

HALE *v.* COLE (1891).

55 J.P. 376.

Proof of Authority of Food Inspector.

The Appellant, a police sergeant, bought gin at the Respondent's public-house, and duly gave notice that it was to be analysed by the public analyst. On analysis it was found to be 44·9 degrees under proof. Proceedings being taken, it was stated at the hearing that the Appellant acted under the direction of his superintendent, but it did not appear that he acted under the direction of the local authority. On the latter ground the justices dismissed the case.

Held, they were wrong.

Where a constable prosecutes for adulteration of food, it is not necessary to prove as a condition precedent that he was directed by the local authority appointing him such constable to prosecute.

(50.)

HIETT (*Appellant*) *v.* WARD (*Respondent*) (1894).

70 L.T. 374 ; 58 J.P. 132 : 461.

Variance between Offence charged and Offence proved.

H., a farmer, was charged with unlawfully selling milk containing 10 per cent. of added water. A carrier was about to deliver a churn of milk sent by H. to a dairyman for sale, and a pint of milk was bought from him, and it had water added as above. H. contended that he did not sell, as the carrier was not his agent, and that the purchaser not having duly separated the purchased article the summons was bad. The justices convicted H. under 42 & 43 Vict. c. 30, s. 3, the article being then in course of delivery, holding that any variance between the charge and the offence proved was cured by 11 & 12 Vict., c. 43 s. 1.

Held, the justices were right.

(51.)

BAKEWELL (*Appellant*) *v.* DAVIS (*Respondent*) (1893).

[1894.] 1 Q.B. 296 ; 63 L.J.M.C. 93 ; 69 L.T. 832 ; 58 J.P. 228.

Analyst's Certificate, Contents of.

B. was charged with sending by railway milk with 22 per cent. of fat less than natural. The analyst's certificate stated that fact, and added, by way of observation, "the abstraction of fat is a fraud." The justices convicted B.

Held that the certificate need not set out the constituent parts of the sample analysed where the case is not one of adulteration ; it need only state the "result" of the analysis.

The "observations" which, in the form of certificate given in the schedule to the Act, follow after the result of the analysis are only to be made where the case is one of adulteration ; but the addition, in cases where adulteration is not charged, of "observations" amounting only to an expression of opinion on the part of the analyst and not to a finding of fact, although unauthorised and improper, will not necessarily vitiate the certificate.

(52.)

NEWBY *v.* SIMS (1894).

[1894.] 1 Q.B. 478 ; 70 L.T. 105 ; 58 J.P. 263 ; 10 T.L.R. 206.

Particulars in Analyst's Certificate.

By Section 6 of the Sale of Food and Drugs Act, 1875, any person selling to the prejudice of the purchaser any article of food not of the nature, substance, and quality of the article demanded, is liable to a penalty, and by Section 21 the certificate of the analyst is made evidence, and by Section 6 of the Amendment Act of 1879, it is made a good defence to a charge of selling rum adulterated only with water to prove that the admixture has not reduced the rum more than 25 per cent. under proof. A certificate declared the result of the analysis to be as follows : "I find that the sample contained an excess of water over and above what is allowed by Act of Parliament. I estimate the excess of water at 13 per cent. of the entire sample. I am of opinion that the sample is not a sample of genuine rum."

Held, that the certificate ought to have stated the proportion of water mixed with the rum, and was insufficient, and a conviction could not be supported.

(53.)

HARRISON (*Appellant*) *v.* RICHARDS (*Respondent*) (1881).

45 J.P. 552.

A Magistrate cannot act on his own opinion, contrary to the Analyst's Certificate.

R. sold milk to H., which was stated to be purchased for analysis, and the milk was duly divided into parts as required by the Statute, and on analysis the certificate of the analyst, after stating the constituents, said the milk was adulterated with 20 per cent. of water. R. being charged with selling adulterated milk, the analyst's certificate was given in evidence, and H. gave no evidence to contradict it ; but the magistrate thinking that the state of the milk might be explained by its standing several hours in a large can, and the best milk at the top ladled out before the purchase, dismissed the summons.

Held, the magistrate was wrong, and as there was no evidence to contradict the certificate of the analyst, he ought to have acted on it, and convicted R.

G.

MISCELLANEOUS CASES.

(54.)

KNIGHT (*Appellant*) *v.* BOWERS (*Respondent*) (1885.)

L.R. 14 Q.B.D. 845 ; 54 L.J.M.C. 108 ; 53 L.T. 234 ; 33 W.R. 613 ; 49 J.P. 614 ; 1 T.L.R. 390 ; 15 Cox, C.C. 728.

Article sold totally different from that demanded.

The Sale of Food and Drugs Act, 1875, after reciting that it is desirable to amend the law regarding the sale of food and drugs in a pure and genuine condition, provides by Section 6 that no person shall sell to the prejudice of the purchaser any article of food or any drug which is not of the nature, substance, and quality of the article demanded by such purchaser under a penalty.

A purchaser asked for saffron, but savin was supplied. The savin was in its natural condition, unadulterated, and not admixed or compounded with any other drug, article, or ingredient.

Held, that Section 6 was not limited in its application to sales of adulterated articles, but that it applied also to cases in which the article sold was unadulterated, but wholly different from that demanded by the purchaser.

(55.)

JAMES *v.* JONES (1894).

[1894.] 1 Q.B. 304 ; 70 L.T. 351 ; 42 W.R. 400 ; 58 J.P. 230 ; 10 T.L.R. 208.

Baking Powder not an Article of Food.

The Appellant sold to the Respondent a packet of baking powder composed of 20 per cent. of bicarbonate of soda, 40 per cent. of ground rice, and 40 per cent. of alum, the last of which ingredients is injurious to health.

Held, that such baking powder was not an article of food, and that the sale of it was not an offence within Section 3 of the Sale of Food and Drugs Act, 1875.

(56.)

ROLFE (or ROLF) *v.* THOMPSON (1892).

[1892.] 2 Q.B. 196 ; 61 L.J.M.C. 184 ; 67 L.T. 295 ; 56 J.P. 425 ; 8 T.L.R. 644.

Entire Sample need not be sent to Analyst.

By Section 3 of the Sale of Food and Drugs Act Amendment Act, 1879 (42 & 43 Vict. c. 30), an inspector is enabled to procure "at the place of delivery any sample of any milk in the course of delivery" to the purchaser or consignee, and if he suspect the milk to have been sold contrary to the provisions of 38 & 39 Vict. c. 63, he "shall submit the same to be analysed." An inspector having taken a sample of milk under the section, divided it, retained one part, and submitted the other part to be analysed.

Held, that he was not bound to submit for analysis the whole of the sample taken by him.

(57.)

KEARLEY *v.* TYLOR (or TONGE) (1891).

60 L.J. M.C. 159 ; 65 L.T. 261 ; 56 J.P. 72 ; 17 Cox, C.C. 328.

Wrong Label put on Lard by Mistake—Refusal of Evidence of Mistake.

E. W., in the employment of and at the request of the Respondent, entered a shop belonging to the Appellants and asked for some lard. He was served with it by the shop assistant, and then handed it to the Respondent, who informed the shop assistant that it was bought for the purpose of analysis. The assistant then noticed that he had inclosed the lard in a wrapper labelled "margarine," and pointed out the mistake. A summons was taken out under Section 6 of the Sale of Food and Drugs Act, 1875 (38, and 39 Vict., cap. 63) and on the hearing of the charge, evidence was called and tendered on behalf of the Appellants that in the hurry of the business, and by mistake their assistant had put the lard in a wrapper marked "margarine," instead of "lard compound," and that such an act was contrary to the express instructions of the Appellants. The justices refused to admit such evidence, and convicted and fined the Appellants.

Held, that the conviction must be quashed, for the evidence tendered and refused was admissible and material.

(58.)

CRANE (*Appellant*) *v.* LAWRENCE (*Respondent*) (1890).

L.R. 25 Q.B.D. 152 ; 59 L.J.M.C. 110 ; 63 L.T. 197 ; 38 W.R. 620 54 J.P. 471 ; 6 T.L.R. 370.

Margarine—Exposed for Sale.

By Section 6 of the Margarine Act, 1887, if margarine "be exposed for sale by retail, there shall be attached to each parcel thereof so exposed, and in such manner as to be clearly visible to the purchaser, a label marked "margarine," and by Section 4 penalties are imposed for offences against the Act.

The Respondent kept margarine for sale in his shop, in a parcel which was not labelled, behind a screen, and not in sight of customers. There was no evidence that this was done for the purpose of evading the Act.

Held, that the margarine was not "exposed for sale" within the meaning of the Act, and the Respondent was not liable to be convicted.

(59.)

WHEAT (*Appellant*) *v.* BROWN (*Respondent*) (1892).

[1892.] 1 Q.B. 418 ; 61 L.J.M.C. 94 ; 66 L.T. 464 ; 40 W.R. 462 ; 56 J.P. 153 ; 8 T.L.R. 294.

Margarine: Exposure for Sale.

By Section 6 of the Margarine Act, 1887, if margarine be "exposed for sale by retail," there shall be attached to each parcel thereof a label of the prescribed size and marked in the prescribed manner.

A dealer in margarine placed a number of parcels of margarine upon the counter of his shop. The parcels were in view of purchasers, but were wrapped in paper, so that they could not see the contents. The paper wrappers had the word "Margarine" printed on them in letters a quarter of an inch square, but no label marked "Margarine" in letters one inch and a half square was attached to any of the parcels in such a manner as to be visible to purchasers. The justices dismissed an information under the above section, on the ground that to constitute an offence the margarine itself must be exposed to the view of the purchaser.

Held, that the meaning of the words "exposed for sale" was not limited to such an exposure as would enable purchasers to see the margarine itself, but that margarine when wrapped in paper so as to be invisible to the purchaser, might be exposed for sale within the meaning of the Act.

(60.)

LANE (*Appellant*) *v.* COLLINS (*Respondent*) (1884).

L.R. 14 Q.B.D. 193 ; 54 L.J.M.C. 76 ; 52 L.T. 257 : 33 W.R. 365 ; 49 J.P. 89 ; 15 COX C.C. 677.

Skimmed Milk so'd as Milk.

It was proved, on an information under Section 6 of the Sale of Food and Drugs Act, 1875, that the Appellant, who was an inspector under the Act, on asking the Respondent, a milk seller, for "milk," was supplied by the Respondent with milk which had been skimmed, and which was in consequence, as compared with normal milk as it comes from the cow, deficient in butter fat to an extent of 60 per cent.

Held, that on these facts it was not proved that any offence had been committed by the Respondent against the provisions of Section 6 of the Sale of Food and Drugs Act, 1875.

(61.)

KIRK (*Appellant*) *v.* COATES (*Respondent*) (1885).

L.R. 16 Q.B.D. 49 ; 55 L.J.M.C. 182 ; 34 W.R. 295 ; 54 L.T. 178 ; 49 J.P. 740 ; 50 J.P. 148 ; 2 T.L.R. 83.

Skimmed Milk: Representation as to Quality of Article Sold.

C. was carrying a milk-can in a street in Huddersfield, which, on inquiry, he told K. contained new milk, and there were other milk-cans in a cart driven by C., some of which he said contained old milk. K. pointed to the can said to contain new milk, and said, "Let me have a pint out of this can?" C., after hesitating, said, "That can contains old milk," and then sold a pint of it, which, when examined, showed a result good enough for old milk, but not for new milk. The expression "old milk" is understood in the district to mean milk which has stood for 12 hours, and from which the cream has been removed. C. was summoned under 38 & 39 Vict. cap. 63, Section 6.

Held, that the justices were right in dismissing the summons, as there had been no sale of new milk, but only of old milk.

APPENDIX, No. 7.

PAPER handed in by Mr. *H. Preston-Thomas*, August 1894.

LIST of PUBLIC ANALYSTS in *England* and *Wales*, with their Remuneration.

COUNTIES.

District.	Name of Analyst.	Remuneration.
Anglesey	W. F. Lowe	10*s.* 6*d.* for each analysis.
Bedfordshire	T. Stevenson	52*l.* 10*s.* per annum, and 6*s.* for each analysis.
Berkshire	W. W. Fisher	2*l.* 12*s.* 6*d.* for each quarterly report, 10*s.* 6*d.* for each analysis, and 1*l.* 1*s.* for each attend ance as a witness, with 3*d.* per mile each way.
Brecknockshire	W. Morgan	15*s.* for every analysis and certificate, 2*l.* 12*s.* 6*d.* for each quarterly report, and 1*l.* 1*s.* and railway fare for each attendance as a witness.
Buckinghamshire	W. W. Fisher	10*s.* 6*d.* for each analysis, 2*l.* 12*s.* 6*d.* for each quarterly report, and 1*l.* 1*s.*, and 3*d.* per mile for each attendance as a witness.
Cambridgeshire	J. W. Knights	5*l.* 5*s.* per annum; 10*s.* 6*d.* for each analysis, and 1*l.* 1*s.*, and 3*d.* per mile for each attend-ance as a witness.
Cambridgeshire, Isle of Ely	J. W. Knights	5*l.* 5*s.* per annum; 1*l.* 1*s.* for each analysis, and 1*l.* 1*s.*, and 3*d.* per mile for each attendance as a witness.
Cardiganshire	H. L. Snape	5*l.* 5*s.* per annum; 10*s.* 6*d.* for each analysis, and 1*l.* 1*s.* a day when attending as a witness.
Carmarthenshire	W. Morgan	2*l.* 12*s.* 6*d.* for each report, 15*s.* for each analysis, and 1*l.* 1*s.* per diem and railway fare, or 3*d.* a mile, when attending as a witness.
Carnarvonshire	W. F. Lowe	2*l.* 2*s.* per annum, and 10*s.* 6*d.* for each analysis.
Cheshire	J. C. Bell	100*l.* per annum; 6*s.* for each analysis.
Cornwall	B. Kitto	2*l.* 2*s.* for each report, 1*l.* 1*s.* for each analysis, 10*s.* 6*d.* for each court attendance at the place where he resides, 1*l.* 1*s.*, and 3*d.* per mile elsewhere.
Cumberland	R. Hellon	1*l.* 1*s.* for each analysis up to 100, 10*s.* 6*d.* for each analysis from 100 to 200, and 6*s.* for each analysis above 200.
Denbighshire	W. F. Lowe	2*l.* 2*s.* per annum, and 10*s.* 6*d.* for each analysis.
Derbyshire	J. White	300*l.* per annum.
Devonshire	A. W. Blyth	10*l.* per annum, and 1*l.* 1*s.* for each analysis.
Dorsetshire	J. C. Leach	20*l.* per annum, and 10*s.* 6*d.* for each analysis.
Durham	W. F. K. Stock	10*l.* 10*s.* per annum; 1*l.* 1*s.* for each analysis up to 100, 10*s.* 6*d.* for each analysis from 100 to 200, and 6*s.* for each analysis over 200; 1*l.* 1*s.* per diem and 3*d.* a mile when attending as a witness.
Essex	T. A. Pooley	1*l.* 1*s.* for each analysis up to 100, 10*s.* 6*d.* for each analysis from 100 to 200, and 6*s.* for each analysis above 200.

LIST of Public Analysts in *England* and *Wales*, with their Remuneration—*continued.*

District.	Name of Analyst.	Remuneration.
COUNTIES—*continued.*		
Flintshire	W. F. Lowe	2*l.* 2*s.* per annum, and 10*s.* 6*d.* for each analysis.
Glamorganshire	W. Morgan	10*s.* 6*d.* for each analysis, and 2*l.* 12*s.* 6*d.* for each report.
Gloucestershire	G. Embrey	100*l.* per annum, and 15*l.* per annum for chemicals. Laboratory provided.
Herefordshire	E. W. Voelcker	1*l.* 1*s.* for each analysis.
Hertfordshire	A. E. Ekins	1*l.* 1*s.* for each analysis up to 50, and 10*s.* 6*d.* for each analysis over 50.
Huntingdonshire	J. W. Knights	10*l.* 10*s.* per anuum.
Kent	M. A. Adams	125*l.* per annum, and 1*l.* 1*s.* for each sample up to 100, 10*s.* 6*d.* for each sample from 100 to 200, and 6*s.* for each sample over 200.
Lancashire	J. C. Brown	300*l.* per annum, and 6*s.* for each analysis and travelling expenses.
Lancashire	W. C. Williams	150*l.* per annum.
Leicestershire	B. Dyer	1*l.* 1*s.* for each analysis up to 100, and 10*s.* 6*d.* for each analysis over 100.
Lincolnshire, Holland Division	C. H. Southwell	10*l.* 10*s.* per annum ; 10*s.* 6*d.* for each analysis, and 3*l.* 3*s.* for attendance as a witness.
Lincolnshire, Kesteven Division	C. E. Cassal	12*l.* 10*s.* per annum ; 10*s.* 6*d.* for each analysis, and 3*l.* 3*s.* per diem for attendance as a witness.
Lincolnshire, Lindsey Division	J. Muter	15*l.* 15*s.* per annum, 10*s.* 6*d.* for each analysis, and 3*l.* 3*s.* per diem and travelling expenses for attendance as a witness.
Merionethshire	T. P. Blunt	1*l.* 1*s.* for each analysis.
Middlesex	E. J. Bevan	1*l.* 1*s.* for each analysis up to 200, and 10*s.* 6*d.* for each analysis over 200.
Monmouthshire	W. Morgan	10*l.* 10*s.* per annum ; 10*s.* 6*d.* for each analysis.
Montgomeryshire	T. P. Blunt	1*l.* 1*s.* for each analysis, 1*l.* 1*s.* per day and railway fare for attendance as a witness.
Norfolk	F. Sutton	2*l.* for each analysis of bread, flour, meal, ales, porter, wines, drugs, and preserved and potted meats ; 1*l.* for each analysis of milk, tea, coffee, chocolate, cocoa, chicory, spirits, spices, arrowroot, pickles, butter, lard, mustard, preserves, jellies, cheese, confectionery, marmalade, bottled fruits and vegetables, tobacco, snuff, and cigars, and 10*s.* 6*d.* each for other articles within the meaning of the Act.
Northamptonshire	W. L. Emmerson	63*l.* per annum, to include all payments for the first 120 analyses ; 10*s.* 6*d.* for each analysis over 120.
Northamptonshire, Soke of Peterborough.	W. L. Emmerson	10*s.* 6*d.* per case.
Northumberland	J. Pattinson	10*l.* 10*s.* per annum ; 10*s.* 6*d.* for each analysis, and 1*l.* 1*s.* per diem when attending as a witness.
Nottinghamshire	O. Hehner	50*l.* per annum, and 1*l.* for each analysis over 50.
Oxfordshire	W. W. Fisher	2*l.* 12*s.* 6*d.* for each report, 10*s.* 6*d.* for each analysis, 10*s.* 6*d.* for each court attendance at Oxford, 1*l.* 1*s.*, and 3*d.* per mile for attendance elsewhere.

LIST of Public Analysts in *England* and *Wales*, with their Remuneration—*continued.*

District.	Name of Analyst.	Remuneration.
COUNTIES—*continued.*		
Pembrokeshire	W. Morgan	5*l.* 5*s.* per annum.
Radnorshire	E. H. W. Swete	1*l.* 1*s.* for each analysis, and travelling expenses.
Rutlandshire	W. L. Emmerson	10*s.* for each analysis, 10*l.* per annum to be the minimum.
Shropshire	T. P. Blunt	13*s.* 4*d.* for each analysis.
Somersetshire	H. J. Alford	150*l.* per annum; 10*s.* 6*d.* per attendance at court, if for one day, if more, 1*l.* 1*s.*; travelling expenses, fare 3*d.* a mile when more than two miles from Taunton.
South Hants	A. Angell	10*s.* 6*d.* for each analysis, 21*l.* per annum to be the minimum.
Staffordshire, North	E. W. T. Jones	100*l.* per annum, and 6*s.* for each analysis.
Staffordshire, South	E. W. T. Jones	100*l.* per annum.
Suffolk, East	J. Napier	10*s.* 6*d.* for each analysis.
Suffolk, West	J. Napier	10*s.* 6*d.* for each analysis.
Surrey	T. Stevenson	1*l.* for each analysis up to 100*l.*; 10*s.* for each analysis from 100 to 200; 5*s.* for each analysis over 200.
Sussex, East	E. H. Moore	50*l.* per annum, and 7*s.* 6*d.* for each analysis.
Sussex, West	O. Hehner	10*s.* 6*d.* for each analysis.
Warwickshire	A. B. Hill	350*l.* per annum.
Westmoreland	R. Hellon	10*l.* 10*s.* per annum, and 1*l.* 10*s.* for each analysis up to 100; 10*s.* 6*d.* for each analysis from 100 to 200, and 6*s.* for each analysis over 200; 1*l.* 1*s.* for each attendance at court, and 3*d.* per mile each way.
Wight, Isle of	O. Hehner	10*s.* 6*d.* per analysis; minimum, 40 samples.
Wiltshire	J. W. Gatehouse	2*l.* 12*s.* 6*d.* for each quarterly report; 10*s.* 6*d.* for each analysis; 1*l.* 1*s.* for attendance as a witness, with 3*d.* per mile each way
Worcestershire	E. H. W. Swete	100*l.* per annum; 10*s.* 6*d.* per attendance at court if within two miles of his residence, 1*l.* 1*s.*, and 3*d.* per mile if beyond. [*See* also under Dudley.]
Yorkshire, East Riding	J. Baynes	1*l.* 1*s.* for each quarterly report; 15*s.* for each analysis up to 100; 10*s.* 6*d.* for each analysis from 100 to 200; 6*s.* for each analysis over 200; 3*d.* per mile travelling expenses, and 1*l.* 1*s.* per diem for compulsory attendance.
Yorkshire, North Riding	T. Fairley	Same as East Riding, except that 2*l.* 12*s.* 6*d.* is allowed for each quarterly report
Yorkshire, West Riding	A. H. Allen	250*l.* per annum, and 6*s.* for each certificate.

LIST of Public Analysts in *England* and *Wales* with their Remuneration—*continued.*

BOROUGHS.

District.	Name of Analyst.	Remuneration.
Albans, St.	J. Morison	10*l.* per annum.
Ashton-under-Lyne	C. Estcourt	1*l.* 1*s.* for each analysis.
Accrington	J. Barnes	5*l.* per annum; 10*s.* 6*d.* for each analysis, and 1*l.* 1*s.* for each attendance as a witness.
Banbury	W. W. Fisher	10*s.* 6*d.* for each analysis, 1*l.* 1*s.* for attendance as a witness, and 1*l.* 6*s.* 3*d.* for each quarterly report.
Bacup	C. Estcourt	10*l.* per annum; or 8*s.* for each analysis.
Barnstaple	A. W. Blyth	5*l.* 5*s.*, and 1*l.* 1*s.* for each analysis.
Bath	J. W. Gatehouse	Fees ranging from 10*s.* 6*d.* to 3*s.* 6*d.* per analysis.
Bedford	J. K. Colwell	1*l.* 1*s.* for each analysis.
Berwick	H. H. Walker	10*l.* per annum, and 10*s.* for each analysis.
Beverley	J. Baynes, junior	2*l.* 2*s.*; and 10*s.* for each analysis of tea and cocoa; 7*s.* for each analysis of milk and coffee, and 5*s.* for each analysis of butter, lard, chicory, bread, flour, and mustard.
Barrow-in-Furness	C. E. Day	25*l.* per annum, 5*s.* for each certificate, and 10*s.* 6*d.* for each attendance at court.
Birmingham	A. Hill	150*l.* per annum.
Blackburn	J. C. Brown	25*l.* per annum, and 6*s.* for each analysis.
Blackpool	—	No separate appointment at present.
Bolton	F. E. Adams	50*l.* per annum.
Bootle-cum-Linacre	J. C. Brown	21*l.* per annum, and 10*s.* 6*d.* for each analysis over 10.
Boston	J. Baynes, junior	2*l.* 12*s.* 6*d.* for each quarterly report, and 10*s.* 6*d.* for each analysis.
Bradford, Yorkshire	F. M. Rimmington	100*l.* per annum, and the cost of chemicals.
Bridgwater	F. W. Stoddart	10*s.* 6*d.* for each analysis of cocoa, butter, vinegar, malt liquors, wine, flour, and bread; 7*s.* 6*d.* for lard; 5*s.* each for coffee, chicory, tea, milk, and mustard; and corresponding amounts for other articles.
Brighton	E. H. Moore	50*l.*, and three classes of fees, 10*s.* 6*d.*, 5*s.*, and 2*s.* 6*d.*
Bristol	F. W. Stoddart	100*l.* per annum, and 50*l.* per annum for expenses of a laboratory.
Burnley	J. C. Brown	21*l.* per annum, and 8*s.* for each analysis.
Bury	T. J. Hutchinson	10*s.* 6*d.* for each analysis.
Bury St. Edmunds	J. Napier	10*l.* 10*s.* per annum; 10*s.* for each analysis up to 50, and 5*s.* for each analysis over 50.
Birkenhead	J. C. Bell	10*l.* 10*s.* per annum; 10*s.* 6*d.* for each analysis after the first 10, and 1*l.* 11*s.* 6*d.* for attending as a witness.
Cambridge	J. W. Knights	5*l.* 5*s.* per annum; 1*l.* 1*s.* for each analysis and certificate. For attending as a witness in Cambridge, 10*s.* 6*d.*, elsewhere, 1*l.* 1*s.*, and 3*d.* a mile.
Canterbury	S. Harvey	10*s.* for each analysis up to 50, and 7*s.* 6*d.* for each analysis over 50.

LIST of Public Analysts in *England* and *Wales*, with their Remuneration—*continued*.

District.	Name of Analyst.	Remuneration.
BOROUGHS—*continued*.		
Cardiff	T. Hughes	250*l*. per annum.
Carlisle	T. H. Walker	12*l*. per annum and 10*s*. 6*d*. for each analysis.
Carmarthen	W. Morgan	15*s*. for each analysis.
Chester	W. F. Lowe	1*l*. 1*s*. for each analysis.
Chesterfield	A. H. Allen	1*l*. 1*s*. for each analysis up to 50, and 10*s*. 6*d*. for each analysis over 50.
Chipping Wycombe	C. E. Cassal	10*s*. 6*d*. for each analysis, 10*s*. 6*d*. for each quarterly report, 1*l*. 1*s*. for attendance as a witness, and 3*d*. per mile travelling expenses from or to London.
Clitheroe	T. Stenhouse	7*s*. 6*d*. for each analysis, 10*s*. 6*d*. for each attendance at court, and railway fare.
Colchester	W. Chattaway	1*l*. 1*s*. for each analysis up to 100, and 10*s*. 6*d*. for each analysis over 100.
Congleton	J. C. Bell	1*l*. 1*s*. for each analysis.
Coventry	A. B. Hill	1*l*. 1*s*. for each analysis, 3*l*. 3*s*. a day and travelling expenses as a witness.
Croydon	L. Reed	2*s*. 6*d*. for each analysis.
Derby	O. Hehner	10*s*. 6*d*. for each analysis.
Devonport	C. E. Bean	2*l*. 2*s*. per quarter, and 10*s*. 6*d*. for each analysis.
Dewsbury	F. M. Rimmington	20*l*. per annum, 10*s*. for each case above 50, travelling and other expenses as a witness.
Doncaster	A. H. Allen	12*s*. 6*d*. for each analysis, 1*l*. 1*s*. per attendance at court.
Dover	S. Harvey	10s. 6*d*. for each analysis.
Dudley	E. H. Swete	There is an arrangement under which the borough contributes a portion of the salary and allowances of the county analyst.
Durham	J. Pattinson	5*l*. 5*s*. per annum; 1*l*. 1*s*. for each analysis up to 100, 10*s*. 6*d*. for each analysis from 100 to 200, and 6*s*. for each analysis over 200.
Eastbourne	E. H. Moore	10*l*. 10*s*. per annum, and 7*s*. 6*d*. for each analysis, the minimum number to be 25.
Exeter	F. P. Perkins	20*l*. per annum, and a moiety of the fees paid for analyses.
Folkestone	S. Harvey	Fees ranging from 10*s*. 6*d*. to 2*l*. 2*s*.
Gateshead	J. Pattinson	100*l*. per annum.
Glossop	J. B. Bell	1*l*. 1*s*. for each analysis up to 25; 10*s*. 6*d*. for each analysis from 25 to 50; 5*s*. for each analysis over 50. As witness, 1*l*. 1*s*. when there is a conviction; travelling expenses only when no conviction.
Gloucester	G. Embrey	20*l*. per annum.
Grantham	A. Ashby	10*l*. per annum; 1*l*. 1*s*. for each report, 10*s*. 6*d*. for each analysis, and 1*l*. 1*s*. per diem when required to attend a prosecution.
Gravesend	J. H. Gramshaw	15*l*. per annum, and the fees on analyses.
Grimsby	J. Baynes, junior	10*l*. 10*s*. per annum, and 10*s*. 6*d*. for each analysis.

List of Public Analysts in *England* and *Wales*, with their Remuneration—*continued*.

District.	Name of Analyst.	Remuneration.
Boroughs—*continued*.		
Guildford	A. Angell	26*l*. 5*s*. per annum, and 2*s*. 6*d*. for each analysis and report.
Halifax	W. Ackroyd	10*s*. for each analysis.
Hanley	J. Baynes, jun.	25*l*. per annum; 6*s*. for each analysis, 1*l*. 1*s*. and expenses as a witness.
Hartlepool	J. Bradburne	21*l*. per annum, and 7*s*. for each analysis.
Hartlepool, West	W. F. K. Stock	10*s*. 6*d*. for each analysis.
Hastings	H. F. Cheshire	75*l*. per annum.
Helens, St.	J. C. Brown	20*l*. per annum, and 8*s*. for each analysis.
Hereford	A. B. Hill	5*l*. 5*s*. per annum; 10*s*. 6*d*. for each analysis; also travelling expenses.
Huddersfield	G. Jarmain	Fee of 5*s*. or 10*s*. 6*d*. per analysis.
Ipswich	J. Napier	5*l*. 5*s*. per annum, 10*s*. 6*d*. for each analysis except milk; 7*s*. 6*d*. for milk.
Kendal	R. Hellon	1*l*. 6*s*. 3*d*. for each quarterly report; 1*l*. 1*s*. for each analysis up to 100; 10*s*. 6*d*. for each analysis from 100 to 200; 6*s*. for each analysis over 200; 1*l*. 1*s*., and 3*d*. per mile for each compulsory attendance at court.
Kidderminster	E. W. T. Jones	15*s*. for each analysis; 2*l*. 2*s*. and travelling expenses when required to attend in Kidderminster.
Kingston-on-Hull	J. Baynes, junior	100*l*. per annum; 1*l*. 1*s*. per day and railway fares when absent from Hull on the business of the corporation.
King's Lynn	J. W. Knights	10*l*. 10*s*. per annum, and 10*s*. 6*d*. for each analysis.
Lancaster	J. C. Brown	10*l*. 10*s*. per annum, and 6*s*. for each analysis.
Leamington	A. B. Hill	20*l*., and 6*s*. 8*d*. for each analysis.
Leeds	T. Fairley	100*l*. per annum.
Leicester	J. Priestley	100*l*. per annum.
Lincoln	C. Harrison	20*l*. per annum.
Liverpool	J. C. Brown	200*l*. per annum.
Liverpool	W. C. Williams	50*l*. per annum.
Louth	J. Baynes, junior	2*l*. 12*s*. 6*d*. for each quarterly report, and 10*s*. 6*d*. for each analysis.
Luton	No information as to present appointment.	——
Macclesfield	C. Estcourt	25*s*. per sample up to 25; 21*s*. for each sample over 25.
Maidstone	M. A. Adams	10*l*. 10*s*., and 10*s*. 6*d*. for each analysis.
Manchester	C. Estcourt	150*l*. per annum.
Margate	S. Harvey	10*s*. 6*d*. per analysis.
Middlesborough	J. E. Stead	10*l*. 10*s*. per annum; 10*s*. 6*d*. for each analysis, and 1*l*. 1*s*. for each attendance at court.
Neath	W. Morgan	10*l*. 10*s*. per annum, and 15*s*. for each analysis.
Newark	A. Ashby	15*l*. 15*s*. per annum; 10*s*. 6*d*. for each analysis; 1*l*. 1*s*. and travelling expenses for attending court.

LIST of Public Analysts in *England* and *Wales*, with their Remuneration—*continued.*

District.	Name of Analyst.	Remuneration.
BOROUGHS—*continued.*		
Newbury	W. T. G. Woodforde	1*l.* 1*s.* for each first analysis, and 10*s.* 6*d.* for others.
Newcastle-under-Lyme	V. Cornish	5*l.* per annum; 1*l.* 1*s.* for each analysis, and 1*l.* 1*s.* for attendance as witness.
Newcastle-on-Tyne	J. Pattinson	100*l.* per annum.
Newport, Monmouthshire	T. Hughes	40*l.* per annum.
Northampton	E. H. W. Swete	1*l.* 1*s.* per case and expenses.
Norwich	W. G. Crook	10*s.* 6*d.* for each analysis.
Nottingham	E. B. Truman	Charges 2*l.* 2*s.* or 3*l.* 3*s.* per analysis.
Oldham	C. Estcourt	Agreement under Section 11 of Act.
Oxford	W. E. Donkin	2*l.* 12*s.* 6*d.* for each report, 1*l.* for each analysis, and certain travelling expenses.
Penzance	J. J. Beringer	1*l.* 1*s.* for each analysis, 1*l.* 1*s.* for attending as a witness, and 1*l.* 1*s.* for each quarterly report.
Peterborough	J. Baynes	4*l.* 4*s.* per annum, and 10*s.* 6*d.* for each analysis over eight.
Plymouth	C. E. Bean	12*l.* 12*s.* per annum; 10*s.* 6*d.* for each analysis, and 1*l.* 1*s.* as a witness.
Poole	J. C. Leach	10*l.* per annum, and 10*s.* 6*d.* per analysis; to include travelling expenses.
Portsmouth	B. H. Mumby	50*l.* per annum.
Preston	J. C. Brown	20*l.* per annum, and 6*s.* for each analysis.
Ramsgate	S. Harvey	10*l.* 10*s.* per annum, and 10*s.* 6*d.* for each analysis.
Reading	A. Ashby	30*l.* per annum.
Reigate	T. Stevenson	1*l.* for each analysis up to 50, 10*s.* for each analysis over 50, and 5*l.* 5*s.* and railway fare as witness.
Rochdale	T. Stenhouse	6*s.* for each analysis.
Rochester	M. A. Adams	15*l.* 15*s.* per annum, and 10*s.* 6*d.* for each sample reported on.
Rotherham	A. H. Allen	2*l.* 2*s.* for each quarterly report, and 10*s.* 6*d.* for each analysis.
Ryde	O. Hehner	10*s.* 6*d.* for each analysis; minimum, 20.
Salford	J. C. Bell	2*s.* 6*d.* for each analysis.
Salisbury	F. W. Stoddart	25*l.* per annum.
Scarborough	H. G. Monk	15*l.* per annum.
Sheffield	A. H. Allen	100*l.* per annum, and 10*s.* 6*d.* for each analysis over 150.
Shrewsbury	A. B. Hill	1*l.* 1*s.* for each analysis.
South Shields	J. Pattinson	75*l.* per annum, and 7*s.* 6*d.* for each analysis.
Southampton	J. Brierley	40*l.* per annum.
Southport	W. J. Orsman	5*s.* for each analysis.
Stalybridge	J. C. Bell	10*l.* 10*s.* per annum, and 10*s.* 6*d.* for each analysis over 10.

LIST of Public Analysts in *England* and *Wales*, with their Remuneration—*continued.*

District.	Name of Analyst.	Remuneration.
BOROUGHS—*continued.*		
Stockport	W. Thomson	10*s.* 6*d.* for each analysis; 2*l.* 2*s.* each attendance at court.
Sunderland	J. C. Wood	5*l.* per annum.
Swansea	W. Morgan	200*l.* per annum.
Tiverton	J. Haworth	10*l.* per annum.
Truro	B. Dyer	10*s.* for each analysis and travelling expenses.
Tynemouth	J. Pattinson	26*l.* 5*s.* per annum, and 7*s.* 6*d.* for each analysis.
Tunbridge Wells	T. Stevenson	1*l.* 1*s.* for each analysis.
Wakefield	E. M. Chaplin	2*l.* 2*s.* for each quarterly report, 12*s.* 6*d.* for each analysis, and 1*l.* 1*s.* for attendance as a witness.
Walsall	E. W. T. Jones	50*l.* per annum.
Warrington	J. H. Gornall	50*l.* per annum.
Warwick	A. B. Hill	5*l.* 5*s.* per annum, and 10*s.* 6*d.* for each analysis.
Wenlock	T. P. Blunt	1*l.* 1*s.* for each analysis.
West Ham	T. A. Pooley	21*l.* per annum, and 10*s.* 6*d.* for each analysis.
West Bromwich	J. White	10*s.* 6*d.* for each analysis.
Weymouth	J. C. Leach	10*l.* per annum, and 10*s.* 6*d.* for each analysis.
Wigan	W. J. Orsman	50*l.* per annum.
Winchester	A. Angell	10*s.* 6*d.* for each analysis.
Windsor	E. J. H. Midwinter	1*l.* 1*s.* for each analysis up to 100; 10*s.* 6*d.* for each analysis from 100 to 200; 6*s.* for each analysis over 200.
Worcester	E. H. W. Swete	25*l.* for the first 40 analyses, 10*s.* 6*d.* each analysis over 40, and 10*s.* 6*d.* for attendance as witness or before the council.
Wolverhampton	E. W. T. Jones	10*s.* 6*d.* for each analysis.
Yarmouth, Great	F. Sutton	Three classes of fees, 40*s.*, 20*s.*, and 10*s.*
York	J. Baynes, junior	2*l.* 12*s.* 6*d.* for each report; 15*s.* for each analysis up to 100; 10*s.* for each analysis over 100; 1*l.* 1*s.* per day and 3*d.* a mile for compulsory attendance at court.

LIST of Public Analysts in *England* and *Wales*, with their Remuneration—*continued*.

METROPOLIS.

District.	Name of Analyst.	Remuneration.
Battersea	C. E. Cassal	100*l.* per annum.
Bethnal Green	A. W. Stokes	10*l.* 10*s.* per annum; 21*s.* for each analysis up to 100, 10*s.* 6*d.* for each analysis from 100 to 200, and 6*s.* for each analysis over 200.
Camberwell	F. L. Teed	157*l.* 10*s.* for first 200 analyses; 10*s.* 6*d.* for first-class samples, and 5*s.* for second-class samples over that number.
Chelsea	L. Parkes	75*l.* per annum.
Clerkenwell	J. K. Colwell	100*l.* per annum.
Fulham	E. G. Clayton	75*l.* per annum.
Greenwich	R. H. Harland	100*l.* per annum.
Hackney	Office vacant	—
Hammersmith	R. H. Davies	100*l.* per annum, to include all laboratory expenses.
Hampstead	A. W. Stokes	50*l.* per annum, and 10*s.* 6*d.* for each analysis.
Holborn	J. K. Colwell	100*l.* per annum.
Islington	F. L. Teed	150*l.* per annum for the first 300 analyses, and 5*s.* per analysis above that number.
Kensington	C. E. Cassal	150*l.* per annum, and fees varying from 2*s.* 6*d.* to 10*s.* 6*d.*
Lambeth	J. Muter	Fees from 2*s.* 6*d.* to 10*s.* per analysis.
Lewisham	S. Rideal	1*l.* 1*s.* for each analysis.
Limehouse	G. A. Rogers	150*l.* per annum.
London (City)	W. S. Saunders	100*l.* per annum.
Mile End Old Town	R. H. Harland	10*s.* 6*d.* for each analysis.
Newington	J. Muter	Fees from 2*s.* 6*d.* to 10*s.* 6*d.* per analysis.
Paddington	A. W. Stocks	150*l.* per annum.
Poplar	W. C. Young	100*l.* per annum for minimum number of 100 analyses.
Rotherhithe	J. Muter	Fees from 2*s.* 6*d.* to 10*s.* 6*d.* per analysis.
St. George-in-the-East	W. C. Young	100*l.* per annum.
St. George's	C. E. Cassal	100*l.* per annum.
St. Giles'	J. K. Colwell	100*l.* per annum.
St. Luke's	A. W. Stokes	50*l.* per annum.
St. Martin's-in-the-Fields	P. A. E. Richards	50*l.* per annum, and 10*s.* 6*d.* for each analysis.
St. Marylebone	A. W. Blyth	100*l.* per annum.
St. Olave's	T. Stevenson	30*l.* per annum, and 10*s.* for each analysis.
St. Pancras	T. Stevenson	Fixed yearly.
St. Saviour's	R. Bodmer	75*l.* for the first 150 samples; above that number, 10*s.* 6*d.* each.
Shoreditch	T. Stevenson	50*l.* per annum, and 10*s.* for each analysis.
Southwark, St. George-the-Martyr.	J. Muter	Fees from 2*s.* 6*d.* to 10*s.* 6*d.* per analysis.
Strand	C. H. Cribb	150*l.* per annum.
Wandsworth	J. Muter	Fees from 2*s.* 6*d.* to 10*s.* per analysis, and court attendance expenses.
Westminster, St. James	J. Edmunds	50*l.* per annum.
Westminster	A. Dupré	100*l.* per annum.
Whitechapel	W. C. Young	21*s.* per analysis for the first 100; 10*s.* 6*d.* per analysis for the next 50; 8*s.* per analysis above 150.
Woolwich	W. R. Smith	50*l.* per annum, and fees received from the public according to scale.

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A.

ACTS OF PARLIAMENT:

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5. *Preventive Measures suggested as regards Adulteration:*

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Belief that it is impossible to prevent the adulteration of butter unless the mixing of margarine and butter is absolutely forbidden; reference to the experience of Mr. Pearson, the buyer of the Wholesale Co-operative Society, and also that of Mr. Lipton's manager, on this subject, *Long* 1937–1939——Objection to the erection of the marble screens usually found where butter is sold, *ib.* 2037–2039——Suggestion that the factory system would be the best method of insuring the purity of such butter, *ib.* 3393, 3394.

Reference to a case at Ilkeston, where a man was convicted because butter supplied by him contained twenty-one per cent. of water; impression that a standard is necessary, but that it should not be fixed without further inquiry, *Smith* 3786, 3787.

See also *Boracic Acid. Colouring. Gloucestershire. Hotels and Restaurants. Markets. Samples.*

C.

Caseine. Information respecting caseine, it being the most useful ingredient in milk for cheese making, *Bannister* 2863–2870.

Cheese. Evidence showing that penalties for the adulteration of cheese were imposed last year in but four cases; contested question as to whether cheese made from skimmed milk is considered to be adulterated, *Preston-Thomas* 323–330——Examination as to the quantity of water and fat contained in various kinds of cheese, with special reference to Cheshire and American cheese, *Bannister* 2803–2807. 2843–2845.

Necessity for the compulsory branding of margarine cheese, or of cheese containing any fat other than butter fat; successful branding of a cheese made by Mr. Cameron, and exhibited at the Dairy Show, *Long* 2898–2909. 3100–3102. 3202-3210——Exception taken to a statement that British cheese has deteriorated; opinion that the various seats of home production have increased both the quantity and quality of the cheese, *ib.* 2910-2924.

Testimony that cheese has maintained its price until this summer, when a distinct fall took place, *ib.* 2925–2930——Opinion that on account of the ease with which it is recognized cheese made from skim milk need not be branded, *ib.* 3211-3215. 3296–3298.

Cheltenham. Examination as to the result of certain investigations in Cheltenham; belief that a considerable number of cases of adulteration were found, but not so large a percentage as in Gloucester, *Hayward* 1002, 1003. 1128, 1129——Conclusion that the much smaller result in respect of adulterated samples in Cheltenham than in Gloucester is due to the greater activity of the authorities in the former place, *Embrey* 1291–1297. 1352–1355. 1466–1469.

Cocoa. Evidence showing that the extraction of fat and the augmentation of the alkali and salts in Van Houten's and other brands of cocoa tend to increase its value as an article of diet, *Bannister* 2704–2706.

Coffee. Information as to the method by which coffee is adulterated with chicory, *Preston-Thomas* 101–106——Opinion that to determine accurately the amount of coffee and chicory in any mixture is a most difficult problem; example in the Birkenhead Corporation case, *Bannister* 863–881. 930–933.

Return showing for the year 1893 the number of samples reported as adulterated and the number of proceedings taken, with the results thereof, *App.*, *p.* 191.

Report, 1894—*continued.*

Coffee—continued.

Abstract of Report of public analysts for the year 1893, showing for the metropolis and for each county and borough in England and Wales the number of samples of coffee examined and the number adulterated, *App., p.* 192.

Colouring (*Butter and Margarine.*) Reference to the colouring of butter; belief that it is forbidden under the Danish Margarine Law, *Preston-Thomas* 435–438——Opinion that margarine should be allowed to be coloured, *Bannister* 960–966.

Examination as to the use of colouring in margarine and butter; opinion that neither margarine nor imported butter should be allowed to be coloured, but that no prohibition should be made in regard to English butter, owing to people having a preference for butter with a certain amount of colour, *Hayward* 1061–1066. 1072–1078. 1107–1110. 1181–1185. 1242. 1258–1261——Inadmissibility of prohibiting the use of colouring in either butter or margarine, *Bannister* 1845–1866——Grounds for recommending that the colouring of margarine should be prohibited, as in Denmark, *Long* 2078–2094. 2100. 2107. 3030–3035. 3065 *et seq.*

Desirability of prohibiting the addition of colouring matter to margarine, but not to butter; belief that such prohibition would lower the price of margarine and raise the price of butter, *Middleton* 2323–2328. 2332, 2333. 2488–2491. 2509–2513. 2592–2598. 2639–2645——Conclusion that very little colouring is used in butter, *ib.* 3287, 3288. 3331–3333——Concurrence in the view that the colouring of margarine should be prohibited, *Farmer* 3512–3519. 3613 *et seq.*; *Smith* 3708–3711. 3746–3759. 3839–3845.

See also *Margarine*, 5. *Milk*, 4.

Confectionery. Abstract of Report of public analysts for the year 1893 showing for the metropolis and for each county and borough in England and Wales the number of samples of confectionery examined and the number adulterated, *App., p.* 192.

Grounds for believing that the Sale of Food and Drugs Act has had a beneficial effect on confectionery, which is now invariably reported as pure, *Preston-Thomas* 126, 127.

Cream. Infrequency of samples of cream being taken for analysis, *Preston-Thomas* 229–231——Statement that whilst there is from eighty-seven to eighty-eight per cent. of water in milk there is fifty per cent. of water in cream obtained by a separator, *Bannister* 2773–2778.

Information as to the practice of adulterating cream by an admixture of milk, *Long* 2968–2971. 3008–3012. 3081–3084——Impossibility of estimating the quantity of cream that would be required to make a pound of butter, *ib.* 3078–3080——Practice to use preservatives in the cream sold in small pots, *ib.* 3299, 3300——Belief that a large quantity of cream is made in London by the use of separators, *Farmer* 3584–3588.

Customs Department. See *Butter*, 3. *Government Laboratory.* • *Samples.*

D.

Decrease of Adulteration. Testimony in the analysts' reports to the fact of the decrease of adulteration generally, *Preston-Thomas* 35, 36.

Denmark. Information as to the custom in Denmark (where mixtures are practically illegal) for the purchaser to mix his own butter and margarine, *Long* 1995–1999. 2007–2009——Immensely increased import of butter from Denmark from 1875 to 1885; *ib.* 2029–2030——Restriction of the Danish law in regard to the packages and labels of margarine; label and guarantee form handed in, *ib.* 2112–2118.

Consideration of the return of butter samples tested at the Government Laboratory at Copenhagen; practice of the Danish Government to spend large sums of money on the encouragement of the butter industry, *Bannister* 2740–2744——Actual produce of 96,000,000 lbs. of Danish butter in 1892, *Long* 2947.

See also *Butter*, 3. *Margarine*, 5.

Drugs. Experience that the adulteration of drugs, although large, is not so common as formerly, *Preston-Thomas* 135——Opinion that there is no necessity for separate legislation for food and for drugs, *Bannister* 2877–2888.

Return showing for the year 1893 the number of samples reported as adulterated and the number of proceedings taken, with the results thereof, *App., p.* 191.

Abstract of Report of public analysts for the year 1893, showing for the metropolis and for each county and borough in England and Wales the number of samples of drugs examined and the number adulterated, *App., p.* 192.

Summary

Report, 1894—*continued.*

Drugs—continued.

Summary of case of White *v.* Bywater, decided in the High Court of Justice, upon the question of standard of quality, *App.* 235.

E

Embrey, George. (Analysis of his Evidence.)—Is Public Analyst for the County and City of Gloucester, and District Analyst under the Fertiliser and Feeding Stuffs Act, 1893; is also a Fellow of the Chemical Society, and is Analyst to the Dairy Produce Defence Association and other bodies, 1262–1267.

Opinion that twenty-five per cent. of all butter that is sold is adulterated, although not more than ten per cent. is detected; necessity for allowing the inspectors greater latitude in the purchase of samples and of analysing imported butter on landing, 1268–1277. 1298, 1299. 1371–1375. 1386, 1387. 1401–1404. 1409–1414——Expediency of compelling local authorities to purchase a certain number of samples and of employing outside officials in any cases of laxity, 1278–1282. 1300–1303. 1376–1379. 1406–1408. 1415, 1416. 1470–1476.

Reference to certain experiments made in Gloucester in which fifteen samples out of sixty-four were found to be margarine or largely adulterated butter; belief that the inability of the public inspector to obtain more adulterated samples was due to a bad method of purchase, and that it is most desirable in the case of butter that an inspector should be able to take his own samples, 1283–1290. 1358. 1384, 1385. 1504, 1505. 1513–1517.

Belief that the much smaller result in respect of adulterated samples in Cheltenham is due to the greater activity of the authorities, 1291–1297. 1352–1355. 1466–1469——Experience of witness that adulterated butter is mostly used in hotels and restaurants, 1304, 1305. 1369, 1370. 1509–1512. 1518–1520——Inadvisability of permitting antiseptics, such as salicylic and boric acid, to be used in butter, 1306–1316. 1356. 1417–1426.

Suggestion that a man who gives a false warranty under Section 22 of the Act of 1875 should be prosecuted, even if his guarantee is a foreign one, 1317–1319. 1427–1434——Opinion that when salt butter contains more than sixteen per cent. of water it is adulterated; discussion as to the cause of the high percentage of water in Irish butter as compared with that made in Australia and New Zealand, 1320, 1321. 1453–1465. 1477–1494.

Reference to a table handed in by witness as proving that pure milk does not fall below a certain standard, 1322–1329. 1341–1343——Views of witness as to the question of a fixed standard for milk; argument that it should present no difficulty and should be fixed at 11·5 for total solids and three per cent. for fats, 1330–1335. 1338–1340. 1344. 1361–1365. 1442–1444——Instance of attempted imposition by a farmer when his cows were milked in the presence of witness, 1335–1337. 1345.

Belief that the milk standard employed in foreign countries is higher than that fixed in this country, 1346–1350. 1451, 1452——Expediency of prohibiting colouring matter in milk, although the small quantity used would produce no ill effects; the practice of colouring is mostly confined to towns, 1351. 1381–1383. 1390–1394.

Reference to the difficulty experienced by Mr. Faeber, the Danish representative in Gloucester, in obtaining adulterated samples of butter, 1357——Possibilities of detecting foreign fat in butter by the present methods of analysis, 1358, 1359——Facility with which milk adulterated with condensed milk could be detected owing to the presence of sugar, 1366–1368——Experience of witness that margarine is frequently sold as butter, 1395–1400.

Tendency of the low standards fixed by Somerset House to prevent analysts from reporting adulterated samples, 1435–1437. 1506–1508——Difficulty of ascertaining the standards of Somerset House, 1438–1441——Reference to the analyses carried out by Veith, who suggested a higher standard for milk than that approved by the public analysts, 1445–1450——Attention of witness called to a sample of butter made in Mr. Elligott's Creamery in Kerry, which on analysis was found to contain over eighteen per cent. of water, 1521–1524.

F.

Farmer, Samuel William. (Analysis of his Evidence.)—Is an alderman of the Wilts County Council; farms a large area of land, 3423–3425.

Evidence to the effect that 2,000 gallons of milk are sent from witness' locality daily to London, principally to the Aylesbury Dairy Company, and that this milk is the produce of sixteen herds of dairy shorthorns, 3426–3432. 3441——Statement that the

Report, 1894—*continued.*

Farmer, Samuel William. (Analysis of his Evidence.)—*continued.*

milk, according to contract, must not contain less than 3·25 per cent. of fat and 8·75 of non-fatty solids; analysis made by the Aylesbury Dairy Company showing that the average for six years has been 3·84 per cent. of fat and 8·92 of non-fatty solids, 3433-3440. 3541-3545. 3591-3598. 3602-3605.

Inability of witness to give evidence as to the supply of milk from a single cow; belief that the proportion of cows giving milk below the standard is very small, 3442-3445. 3495-3500. 3633, 3634——Reference to the large supplies of separated milk that are sent to London in times of scarcity; practice of witness when there is an over-supply of milk, and butter is made, to give the separated milk to the pigs, 3446-3450——Grounds for believing that the adoption of too low a standard tends to legalise adulteration; advisability of making the standard for fat not less than three per cent., 3450-3454. 3492-3494. 3537-3540. 3546-3549. 3599-3601. 3674-3677——Detailed information as to the feeding of the cows owned by witness; experience that in seasons when fodder is bad the addition of linseed to the food increases the proportion of fatty solids, 3455-3491. 3529-3536. 3609-3611.

Grounds for the opinion that imprisonment would be the only deterrent to adulteration, and that to avoid injustice permission should be given to have a sample from the cow analysed in cases where the milk could be traced, 3501-3506. 3550-3556. 3657-3659. 3665, 3666——Objection to the colouring of magarine as conducive to fraud, 3512-3519. 3613-3616. 3640-3645. 3651-3656. 3660-3664——Practice of witness to weigh the milk of each cow weekly, but not to test the quality of the milk; impression that farmers would not have sufficient skill to render their tests reliable, 3520-3528.

Desirability of checking the profitable practice of adulterating new with separated milk; suggestion that owing to the difficulty of detecting such adulteration rewards should be offered to any employés who would give information leading to conviction, 3557-3572. 3582, 3583. 3612. 3635, 3636——Statement that in Wiltshire the administration of the Adulteration Acts is under the General Purposes Committee of the County Council; probability that a travelling inspector might detect more cases of fraud than a local man, 3573-3581.

Belief that a large quantity of cream is made in London by the use of separators, 3584-3588——Inadvisability of feeding cows with grains only, 3589, 3590. 3630-3632——Expediency of prohibiting mixtures of margarine and butter, 3617, 3618. 3646-3650.

Enumeration of the foods the use of which will increase the quantity of milk at the expense of the quality; opinion that if a proper standard were fixed cows would be fed so as to reach such standard, 3619-3624——Opinion that milk is coloured by the dealers in London, 3625-3629.

Explanation of the circumstances which affect the price of milk; rough estimate that at the farm it would be from 5*d.* to 6*d.* per imperial gallon in the summer and from 8*d.* to 9*d.* in the winter, 3637-3639——Examination as to the sealing of milk churns; the Great Western and South Western Companies permit churns to be sealed, which is a great advantage, 3667-3673.

Fines and Penalties. Evidence to the effect that out of 3,174 cases of legal proceedings in 1893 fines were inflicted in 2,687 instances, *Preston-Thomas* 37-42. 210-212——Great complaints made respecting the inadequacy of the present system of fines; infrequency of cases in which maximum fines are inflicted, so that the effect is not sufficiently deterrent, *ib.* 43-46. 178, 179. 275-277. 305-307——Inadvisability of a minimum fine, *ib.* 47, 48——Desirability of allowing fines to go to the sanitary authorities instead of the County Fund, *ib.* 140-143.

Inadequacy of the present system of fines; opinion that a maximum and minimum should be fixed, *Hayward* 1170-1172.

Return showing the number and amount of penalties imposed in 1893, in respect of each class of article, *App., p.* 191.

See also *Imprisonment.*

Flour. Return for the year 1893, showing for the metropolis and for each county and borough in England and Wales the number of samples of flour examined and the number adulterated, *App., p.* 192.

Foreign Countries. Suggestion that the Committee should ascertain how the standards for milk and butter are dealt with in Berlin and Paris, *Preston-Thomas* 183-185——Opinion that the Committee might with advantage also ascertain the methods by which foreign countries endeavour to suppress adulteration, *ib.* 308, 309. 492. 522-525.

Attention of witness called to the fact that in New Hampshire artificial butters are coloured pink, and that New Jersey allows no colouring whatever, whilst the Russian Government order that both the margarine and the vessels in which it is packed shall be dyed red, *Hayward* 1198-1203.

Germany

G.

Germany. Belief that the prohibition in Germany of mixing margarine with butter has considerably lessened the amount of adulteration, *Long*, 1964, 1965.

Ginger. Probability of the cheaper gingers containing a certain amount of spent ginger, *Bannister* 2699–2703.

Gloucestershire. Object of the Dairy Produce Defence Association to inquire into the extent to which adulteration existed in regard to butter and milk in Gloucestershire, where the Adulteration Acts have always been in abeyance, *Hayward*, 984, 985. 1130, 1131——Detailed information as to ninety-four samples of butter purchased in the city of Gloucester, sixty-four of which were analysed and fifteen found to be very largely adulterated with from twenty to fifty per cent. of foreign fats; the corporation were informed of this result, and inflicted fines in four cases out of the fifteen; *ib.* 986–1001. 1043–1047. 1080–1082. 1101–1106. 1118–1121. 1132. 1165–1169. 1195–1197.

Reference to the state of suspended animation of the association since its first effort in Gloucester, owing to lack of funds; contention that although its existence was short it did good work, *Hayward* 1011–1015. 1018–1024——Belief that the corporation have not gone on with the work started by the association, *ib.* 1016, 1017. 1048, 1049, 1068, 1069——Apathy of the people of Gloucester in regard to adulteration, *ib.* 1025–1033. 1070, 1071. 1162–1164. 1222–1230.

Explanation that witness brought the cases of adulteration in Gloucester under the notice of the county council, and the chief constable was authorised to employ women to procure samples, but with no special result, *Hayward* 1038–1041——Belief that margarine is sold largely in Gloucester, and that there should be no objection to the sale of margarine provided it is labelled as such, *ib.* 1057–1060. 1091. 1099, 1100. 1180——Infrequency of cases of prosecution in Gloucester; reference to one instance in which the Danish Commissioners instituted the first prosecution, *ib.* 1089, 1090. 1173–1179——Evidence showing that plenty of butter made in the locality of Gloucester is sold for one shilling per pound, *ib.* 1156–1162.

Reference to certain experiments made with butter in Gloucester in which fifteen samples out of sixty-four were found to be margarine, or largely adulterated; belief that the inability of the public inspector to obtain more adulterated samples was due to the bad method of purchase, and that it is most desirable in the case of butter that an inspector should be able to take his own samples, *Embrey*, 1283–1290. 1358. 1384, 1385. 1504, 1505. 1513–1517——Difficulty experienced by M. Faeber, the Danish representative in Gloucester, in obtaining adulterated samples of butter, *ib.* 1357.

Government Laboratory (Inland Revenue and Customs):

Particulars of a case tried in Bristol last June in the presence of three analysts in which the certificate from Somerset House was not considered to be legal evidence according to the Act of 1875; opinion that this is the first question that has arisen on this point since the passing of the Act, *Bannister* 759–771.

Information as to the staff employed at Somerset House and the work done; denial of the suggestion on the part of some of the public analysts that there is a want of experience, *Bannister* 772–779——Inexpediency of removing the Chemical Court of Appeal from the Inland Revenue to the Local Government Board, *ib.* 889–893——Statement that the results of the analyses made in the Government Laboratory are accessible although they are not all reported to the Local Government Board, *ib.* 894–900.

Suggestion as to the establishment in connection with the Local Government Board of a department and a laboratory to deal specially with dairy produce to which the public, by payment of a small fixed fee might send samples for analysis; details showing that a similar institution in New York State has practically abolished the manufacture and sale of margarine, *Long* 1892–1899. 2128–2132. 2140. 2171, 2172.

Tendency of the low standards fixed by Somerset House to prevent analysts from reporting adulterated samples, *Embrey* 1435–1437. 1506–1508——Difficulty of ascertaining the standards of Somerset House, *ib.* 1438–1441.

Practice to refuse to analyse articles which the change of composition has rendered unfit for analysis, *Bannister* 1693, 1694——Explanation of the certificates granted at the laboratory under the sale of Food and Drugs Acts; they certify the results of the analyses made, *ib.* 1695–1700——Explanation that the laboratory is connected with the Board of Agriculture as well as with the Local Government Board, *ib.* 2849, 2850.

See also *Analysts and Analyses.* *Milk*, 2. *Samples.*

Reports, 1894—*continued.*

H.

Hayward, Lieut.-Colonel John Frederick Curtis. (Analysis of his Evidence.)—Was one of the chief promoters of the Dairy Produce Defence Association, formed in 1892; is a county councillor for Gloucestershire and a member of the Council of the Royal Agricultural Society and of the Council of the British Dairy Farmers' Association, 981–983. 1034–1037.

Object of the association to inquire into the extent to which adulteration existed in regard to butter and milk in Gloucestershire, where the Adulteration Acts have always been in abeyance, 984, 985. 1130, 1131 — Detailed information as to ninety-four samples of butter purchased in the city of Gloucester, sixty-four of which were analysed and fifteen found to be very largely adulterated with from twenty to fifty per cent. of foreign fats; the corporation were informed of this result and they inflicted fines in four cases out of the fifteen; 986–1001. 1042–1047. 1080–1082. 1101–1106. 1118–1121. 1132. 1165–1169. 1195–1197.

Examination as to the result of the investigations in Cheltenham; belief that a considerable number of cases of adulteration were found, but not so large a percentage as in Gloucester, 1002, 1003. 1128, 1129——Inadvisability of sending men to obtain samples of butter; suggestion, however, that inspectors should be empowered to employ whatever agent they consider most suitable, 1004–1010. 1083–1089. 1122–1127.

Reference to the state of suspended animation of the association since its first effort in Gloucester, owing to lack of funds; contention that although its existence was short it did good work, 1011–1015. 1018–1024——Belief that the corporation have not gone on with the work started by the association, 1016, 1017. 1048, 1049. 1068, 1069——Apathy of the people of Gloucester in regard to adulteration, 1025–1033. 1070, 1071. 1162–1164. 1222–1230——Contention that when Acts of Parliament are passed by the State it is the duty of the State to see that they are duly carried out, 1029. 1050–1052. 1189, 1190.

Explanation that witness brought the cases of adulteration in Gloucester under the notice of the county council, and the chief constable was authorised to employ women to procure samples, but with no special result, 1038–1041——Desirability of the appointment of travelling inspectors to correct the inaction of the local authorities, 1053–1056. 1067. 1079——Belief that margarine is sold largely in Gloucester, and that there should be no objection to the sale of margarine provided it is labelled as such, 1057–1060. 1091. 1099, 1100. 1180.

Examination as to the use of colouring in margarine and butter and as to the degree of restriction desirable, 1061–1066. 1072–1078. 1092–1098. 1107–1110. 1181–1185. 1242. 1258–1261——Infrequency of cases of second prosecution in Gloucester; reference to one instance in which the Danish Commissioners instituted the first prosecution, 1089, 1090. 1173–1179——Expediency of rendering any admixture of margarine and butter illegal, 1113–1117.

Contention that adulteration is the cause of the depression in the price of butter, and that retail traders in a town to a great extent rule the price; attention of witness called hereon to the official quotation for butter fixed weekly in Denmark and Copenhagen, 1133–1156. 1191–1194. 1204–1209——Evidence showing that plenty of butter made in the locality of Gloucester is sold for one shilling per pound, 1156–1162 —— Inadequacy of the present system of fines; belief that a maximum and minimum should be fixed, 1170–1172.

Opinion that there would be no advantage in handing over the administration of the Sale of Food and Drugs Acts to the parish councils, 1186–1188——Attention of witness called to the fact that the New Hampshire artificial butters are coloured pink, and that New Jersey allows no colouring whatever, whilst the Russian Government order that both the margarine and the vessels in which it is packed shall be dyed red, 1198–1203 —— Evidence showing that merchants deal mostly with foreign butter manufacturers owing to the demand for absolute uniformity in the butter; such uniformity is only acquired in a blending house, and is absolutely impossible with pure butter, 1210–1214. 1247–1254.

Reference to an instance in which a large London dealer refused to purchase butter from witness on the ground that he would have no sale for it as compared with Brittany butter, 1214–1221 — Examination as to whether the so-called butter served in eating-houses is not margarine; probability that such is the case, 1232–1241—— Opinion that the production of margine in England is increasing, 1243–1246.

Health. Opinion that the section of the Act of 1875 relative to adulterations injurious to health is very little used, partly because such adulterations have greatly diminished, and partly through the necessity for proving wilful knowledge, *Preston-Thomas* 13, 14——Difficulties of taking proceedings under the first portion of the Act of 1875 relative to the admixture of ingredients noxious to health, *ib.* 459–461.

Report, 1894—*continued.*

Health—continued.

Statement that no references have been made to Somerset House in connection with ingredients injurious to health, *Bannister* 858, 859.

Hotels and Restaurants. Experience of witness that adulterated butter is mostly used in hotels and restaurants, *Embrey* 1304, 1305. 1369, 1370. 1509–1512. 1518–1520——Grounds for believing that mixtures of butter and other ingredients are largely used in hotels and restaurants; statement that although in such cases the mixtures are difficult of detection by taste, it is possible to detect them where the percentage of adulteration is sufficiently large, *Long* 1975–1980——Conclusion that prohibitive measures in regard to margarine should extend to hotels and restaurants, *Middleton* 2334–2336. 2649–2653.

I.

Imports. Desirability of treating the adulteration of all articles of food and drink in the same manner as contagious diseases of animals, by inspection at the ports, and by the stoppage of all adulterated imports; belief that such practice might possibly raise the price of food, but would enable the consumer to obtain a pure article, *Smith* 3686–3699. 3790–3792. 3815–3820. 3861–3872.

Imprisonment. Approval of imprisonment rather than fines in exceptional cases, the former being sometimes too lenient, *Preston-Thomas* 275–277. 305–307——Opinion that a man who has been convicted three times for adulteration should be liable to imprisonment, *Long* 1922–1924. 2182–2184. 3306–3311.

Grounds for the conclusion that imprisonment is the only deterrent to adulteration, as in the case of milk, and that to avoid injustice permission should be given to have a sample from the cow analysed in cases where the milk could be traced, *Farmer* 3501–3506. 3550–3556. 3657–3659. 3665, 3666.

Inland Revenue Department. See *Analysts and Analyses. Government Laboratory. Samples.*

Inspection. Evidence showing the advisability of inspecting retailers' shops, wholesale dealers, and manufactories; question as to whether the present law gives power to inspect margarine factories, *Long* 1926, 1927. 1929–1936——Expediency of placing the power of inspection in the hands of the Board of Agriculture rather than the Local Government Board, *Middleton* 2568, 2569.

Inadequacy of the present system of inspection; reference hereon to the few milk and butter samples taken in Hampshire, *Long* 3013–3029——Opinion that if farms and retail shops were subject to rigorous examination it would prevent outbreaks of disease and would prove a preventive against adulteration, *ib.* 3106–3111. 3221–3223.

See also *Analysts and Analyses. Samples. Travelling Inspectors.*

International Conference. Examination upon the question of holding an international conference on dairy products, as suggested by the Danish Government to Lord Rosebery in July 1893; opinion that this country might take action by itself, *Smith* 3715–3726.

L.

Lard. Statement that in 1873 out of 1,600 samples of lard eight per cent. were condemned owing to adulteration with cotton-seed oil and beef fat stearine, *Preston-Thomas* 113–116——Reference to twenty-three samples of lard sent to Somerset House and said to be adulterated with beef stearine; there were ten cases of disagreement with the analysts, as no trace of such adulteration could be detected, *Bannister* 2882–2886.

Return showing for the year 1893 the number of samples reported as adulterated and the number of proceedings taken, with the results thereof, *App., p.* 191.

Abstract of Report of public analysts for the year 1893, showing for the metropolis and for each county and borough in England and Wales the number of samples of lard examined and the number adulterated, *App., p.* 192.

Legal Proceedings. Estimate that between sixty and seventy decisions have been pronounced in the High Courts on various points arising out of the several Acts, *Preston-Thomas* 18–20. 203——Examination as to the number of cases in which proceedings were taken as regards adulteration; out of 4,793 samples reported against last year, proceedings were taken in 3,174 instances, and in 2,687 of these fines were imposed, *ib.* 37–42. 210–212——Evidence respecting the few prosecutions instituted by private persons; belief that people are reluctant to perform an important duty while there is a public authority to undertake it, *ib.* 247–250. 403.

Report, 1894—*continued.*

Legal Proceedings— continued.

Desirability of allowing a man against whom a process for adulteration has been taken to have the right of sending a sample for analysis on his own account, *Bannister* 753–758——Suggestion that a man who gives a false warranty under Section 22 of the Act of 1875 should be prosecuted, even if his guarantee is a foreign one, *Embrey* 1317–1319. 1427–1434.

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Summary of cases decided in the High Court of Justice upon various questions which have arisen in the administration of the Acts, *App., p.* 224——Cases decided upon the subject of legal proceedings and the procedure to be followed, *ib.*

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Local Authorities. Evidence respecting the great variation in the activity of the authorities of the various districts; where the Act is efficiently administered it has (as in the case of pepper) the effect of reducing the amount of adulteration, *Preston-Thomas*, 253–259. 272. 360–380. 385, 386. 400–402. 533——Complaint on the part of the North and South Staffordshire inspectors in regard to the inactivity of neighbouring local authorities; explanation hereon that inspectors act under the authority of the Sanitary Committee of the County Council, *Smith* 3726-3728. 3730.

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Long, James. (Analysis of his Evidence.)—Is a member of the Council and of the Margarine Committee of the Central Chamber of Agriculture, and also a member of the British Dairy Farmers' Association; was formerly Professor of Dairying at the Royal Agricultural College, Cirencester, 1883–1885.

Explanation that witness advocates the twelve proposals contained in the Report of the Margarine Committee, 1886–1888——Suggestion as to the establishment, in connection with the Local Government Board, of a department and a laboratory to deal with dairy produce, to which the public by payment of a small fixed fee might send samples for analysis; details showing that a similar institution in New York State has practically abolished the manufacture and sale of margarine, 1892–1899. 2128–2132. 2140. 2171, 2172.

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Suggested employment of inspectors to compel local authorities to carry out the Adulteration Acts, 1915-1919——Expediency of permitting inspectors to select any suitable person to take samples, 1920, 1921——Opinion that a man who has been convicted three times for adulteration should be liable to imprisonment, 1922–1924. 2182–2184.

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Information as to the large quantities of margarine imported into Limerick, one of the headquarters of the Irish butter trade, 1939–1941——Experience that, to a large extent, margarine mixtures come from France; reference to certain French factories visited by witness in which butter was blended with margarine and labelled "Pure dairy butter," 1942-1951——Impossibility of sending pure French butter, which sells in the Parisian markets for 2*s.* 7*d.* and 2*s.* 9*d.* per lb., to England at 1*s.* 2*d.* and 1*s.* 4*d.* per lb., 1951. 2010.

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Information respecting the adulteration of Hamburgh butter, 1966–1970——Explanation of the process employed in blending margarine and butter, 1971, 1972——Visit of witness to a London warehouse where a mixture was being sold as pure butter which contained 25 per cent. of margarine, 1973, 1974——Grounds for believing that

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mixtures are largely used in hotels and restaurants; statement that although such mixtures are difficult of detection by taste, it is possible to detect them where the percentage of adulteration is sufficiently large, 1975–1980.

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Statement that pure margarine contains about 5 per cent. of butter fat, 2004–2006 ——Question regarding the general price of butter; estimate of Mr. Dodge, the American statistician, giving the prices of butter in various countries, 2011–2014 —— Details as to the amount of margarine manufactured on the Continent, and showing that the bulk of oleo-margarine oil exported from America goes to Holland; estimate that the margarine sent from Holland is equal to about 5 lbs. per head of our population per annum, 2015–2023. 2027, 2028.

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MARGARINE:

1. *Constituents of Margarine: Extent to which mixed with Butter or sold as Butter.*
2. *Home Production.*
3. *Foreign Production and English Import.*
4. *Various Suggestions for the Prevention of Fraud and the Protection of the Public.*
5. *Laws and Regulations of Foreign Countries.*
6. *Exposure for Sale.*

1. *Constituents of Margarine: Extent to which mixed with Butter or sold as Butter:*

Detailed information showing that the best margarine is made from refined beef fat, to which a certain quantity of butter is sometimes added and then churned with milk and vegetable oils to render it similar in composition to butter; opinion that the inferior sorts are made of hard fat, *Bannister* 665–672. 675–681. 686–689. 901–908.

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Attention of witness called to the large quantities of margarine and mixture used in institutions for the poor; opinion that it should be bought separately and mixed according to requirements, *Middleton* 2646–2648. 2671–2682——Enumeration of the soluble and insoluble acids present in butter and good fat; opinion that margarine is as nutritious as butter, *Bannister* 2707–2710. 2831–2838. 2897——Instances in which a mixture, adulterated with between 80 and 90 per cent. of foreign fat, has been sold as pure butter; preventive measures suggested, *Smith* 3708–3711. 3737, 3738. 3746–3759. 3829-3838.

2. *Home Production:*

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Evidence showing that whilst the Act of 1887 provides against the use of improper fats in margarine of English manufacture, there is no check on that which is imported; return given of the butter and margarine imported since 1891, *Bannister* 909–916——Examination as to the action of the Customs Department in connection with imported margarine; the Custom House analyst will now be under the supervision of witness, *ib.* 921–929.

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Information as to the large quantities of margarine imported into Limerick, one of the headquarters of the Irish butter trade. *Long* 1939–1941——Large extent to which margarine mixtures come from France; reference to certain French factories visited by witness in which butter was blended with margarine and labelled "Pure dairy butter," *ib.* 1942-1951.——Details as to the amount of margarine manufactured on the Continent, and showing that the bulk of oleomargarine oil exported from America goes to Holland; estimate that the margarine sent from Holland is equal to about 5 lbs. per head of our population per annum, *ib.* 2015–2023. 2027, 1028. 3095-3099.

Estimate showing that the average increase in the importation of margarine and butter from 1888 to 1893 is 1·6 and 6·5 per cent. per annum, respectively, *Bannister* 2820-2824. 2895, 2896.

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MARGARINE—continued.

4. *Various Suggestions for the Prevention of Fraud and the Protection of the Public:*

Expediency of rendering any admixture of margarine and butter illegal, *Hayward* 1089, 1090. 1173-1179——Explanation that witness advocates the twelve proposals contained in the Report of the Margarine Committee, *Long* 1886–1888——Desirability of compelling all small packages of margarine to be labelled with the single word "Margarine" in dark, thick lettering, *ib.* 1904, 1905. 1908–1914.

Impossibility of checking the sale of margarine as butter unless the colouring of margarine is prohibited, as in Denmark; opinion that such prohibition together with that forbidding mixtures would be an effectual check to adulteration, *Long* 2078-2094. 2100–2107——Belief that if margarine tubs are made of a specific shape, as in Sweden and Denmark, there is no necessity for colouring them; desirability of exacting the use of a certain shape owing to the practice of margarine manufacturers to imitate all the fancy forms in which butter is made, *ib.* 2095–2099. 2110, 2111.

Contention that it would be beneficial if wholesale margarine manufactories were inspected and all vendors were registered, *Middleton* 2337–2343. 2557–2560. 2631–2633. 2654, 2655——Suggestion that shops should have a separate counter for the sale of margarine, *ib.* 2344-2346. 2603–2606. 2660–2664——Expediency of strictly enacting that all mixtures should be sold as margarine; belief that this would cause margarine to be sold at a lower price than at present, *ib.* 2347–2352. 2463-2467. 2497. 2550–2556. 2586–2591. 2668–2671.

Concurrence in any proposals respecting the lettering of packages and the shape of vessels containing margarine which might tend to prevent its substitution for butter; belief that the colouring of the vessels would not appreciably add to the expense of this commodity, *Middleton* 2501-2506. 2514–2521. 2656——Opinion that no objection could arise to margarine being made in 1 lb. and ½ lb. blocks, *ib.* 2599–2602——Question as to whether the proposals relating to margarine would not benefit foreign producers in a larger proportion than English farmers; opinion that this would be immaterial provided our own producers were protected, *ib.* 2607–2610. 2634–2638.

Improbabilty of restrictive measures in regard to the manufacture of margarine on the continent causing a larger influx of milk to England, *Middleton* 2611–2614——Inexpediency of making any change in the law which compels mixtures to be sold as margarine, *Bannister* 2815-2819.

Desirability of making regulations not only forbidding the colouring of margarine but enforcing the use of specially shaped or coloured packages, and, in the case of importations, providing for an examination at the port of entry; conclusion that the prohibition of colouring and mixing would be an effectual check to adulteration and would reduce the price of margarine, *Long* 3030–3035. 3065-3070. 3085-3094. 3103. 3247, 3248. 3256, 3257. 3286. 3289-3291. 3327-3330. 3334-3336. 3352–3357. 3397, 3398——Concurrence in the suggestion that there should be full power to inspect and take samples in the case of margarine factories, *ib.* 3216, 3217, 3258–3261. 3301——Opinion that provided sellers of margarine are registered there is no necessity to impose a fee, *ib.* 3279–3282. 3399–3401.

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5. *Laws and Regulations of Foreign Countries:*

Particulars of the Danish, Swedish, German, Belgian and French laws relating to margarine; copy of a proposed new French bill, handed in, *Long* 1803–1807. 2112–2127——Examination as to the regulations in various American States respecting the colouring and sale of margarine; belief that in States where the law is strictly enacted adulteration is very much checked, *ib.* 2031–2034. 2133-2139——Practice in the United States to require every person selling margarine to take out a licence. *ib.* 2031–2034——Particulars of the proposed French Bill in reference to the sale of margarine, *ib.* 2948.

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MILK:

1. *Constituents and Quality: Variation under different Conditions.*
2. *Analysis: Results of different Processes.*
3. *Standard: Regulations in France and other Foreign Countries.*
4. *Colouring.*
5. *Condensed Milk and Skimmed Milk.*
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9. *Adulteration; Legal Proceedings, and Preventive Measures:*

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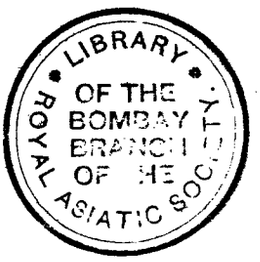
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